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USE OF POLYGRAPHS AS "LIE DETECTORS" BY THE FEDERAL GOVERNMENT

Part 1—Panel Discussion With Private Polygraph Practitioners

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE COMMITTEE ON GOVERNMENT OPERATIONS HOUSE OF REPRESENTATIVES

EIGHTY-EIGHTH CONGRESS

SECOND SESSION

APRIL 7, 8, AND 9, 1964

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USE OF POLYGRAPHS AS "LIE DETECTORS" BY THE FEDERAL GOVERNMENT

(Part 1—Panel Discussion With Private Polygraph Practitioners)

TUESDAY, APRIL 7, 1964

HOUSE OF REPRESENTATIVES,
FOREIGN OPERATIONS AND
GOVERNMENT INFORMATION SUBCOMMITTEE
OF THE COMMITTEE ON GOVERNMENT OPERATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., pursuant to call, in room B-300, Rayburn Office Building, Hon. John E. Moss (chairman of the subcommittee) presiding.

Present: Representatives John E. Moss, Porter Hardy, Jr., Henry S. Reuss, John S. Monagan, George Meader, and Robert P. Griffin.

Also present: Representative Cornelius E. Gallagher.

Staff members present: Samuel J. Archibald, staff administrator; Jack Mattison, chief investigator; and Benny L. Kass, subcommittee counsel.

Mr. Moss. The subcommittee will be in order.

I regret that the hearings today will not be, at least from a physical standpoint, under the most ideal of conditions, but if everyone will be quiet, I think we can hear the witnesses as the hearings get underway.

Several months ago Chairman William Dawson directed the Subcommittee on Foreign Operations and Government Information to study the use of polygraphs, commonly referred to as lie detectors, in the Federal Government. The directive was based on the mandate of the Government Operations Committee to study the operations of Government activities at all levels with a view of determining economy and efficiency.

As the first step in the study, a questionnaire was sent to 58 Federal departments and agencies to determine whether they use polygraphs and, if so, the extent and conditions of the use. According to the responses received, 19 agencies used polygraphs during fiscal year 1963.

These 19 agencies owned 512 polygraphs which were acquired at a cost of more than $425,000. Some 639 examiners were hired to operate the instruments, and operating costs, which are rising annually, now approach $4½ million.

Detailed answers to the questionnaire and a summary of the replies are contained in the committee print entitled, "Use of Polygraphs by the Federal Government." This preliminary study shows that these

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devices are used under widely varying conditions in the Federal Government. The training and qualifications of polygraph examiners differ substantially from agency to agency as do the controls exercised on the use of the instruments.

Serious questions have been raised by responsible persons as to whether the polygraph is, indeed, an instrument which should be used for any purpose. If used, what should be the extent and condition of its use?

The subcommittee has neither condemned nor condoned the use of polygraphs by the Federal Government. The inquiry is designed to develop as much factual information as possible to clarify the problems involved in the use of polygraphs. The hearings will begin today with a panel discussion with nationally recognized experts on the use of polygraphs.

On the following days we will take testimony from representatives of some Federal agencies which use polygraphs. By a careful, objective study of the problems, we hope to point the way to possible solutions.

At this point I ask unanimous consent to insert in the record a copy of the letter from Congressman Dawson directing the subcommittee to investigate the use of polygraphs in the Federal Government.

Is there any objection? Hearing none, the letter will be included at this point in the record.

(The letter referred to follows:)

CONGRESS OF THE UNITED STATES,
COMMITTEE ON GOVERNMENT OPERATIONS,
Washington, D.C., March 12, 1964.

Hon. JOHN E. MOSS,
Chairman, Foreign Operations and Government Information Subcommittee, House Office Building, Washington, D.C.

DEAR COLLEAGUE: In April 1963 I directed the Foreign Operations and Government Information Subcommittee to study and analyze the use of polygraphs within the Federal Government. It is my understanding that the subcommittee has compiled a great deal of information on this subject and now intends to hold hearings.

I am sure the subcommittee will fully explore this area. Please report your findings, with recommendations for action, to the full committee as soon as possible.

Sincerely,

WILLIAM L. DAWSON, *Chairman.*

Mr. Moss. Our witnesses today are Mr. Fred E. Inbau, Northwestern University School of Law; Mr. Cleve Backster, School of Lie Detection, New York; Mr. John E. Reid, John E. Reid & Associates, Chicago, Ill., and Mr. George Lindberg, John E. Reid & Associates, Chicago, Ill. Mr. Backster will be here very shortly.

Before swearing the witnesses, do any of the subcommittee members wish to make any statements?

Mr. GALLAGHER. Mr. Chairman.

Mr. Moss. We have as a very distinguished Member of Congress, not a member of this subcommittee, Congressman Gallagher.

Mr. GALLAGHER. Thank you, Mr. Chairman.

I wish to take this opportunity to thank Mr. Dawson for forwarding the letter that I sent to him requesting this investigation. I wish to compliment you, Mr. Chairman, and the members of the staff and the subcommittee, who made such an excellent preliminary study of the

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problem, wherein they justified the need for the hearings that are beginning today.

I am concerned with some of the basic rights which people sought when they came to this new land in the face of great danger and hardship, seeking to be free of the oppressive tyrants who ruled elsewhere at those times. Among the basic rights perhaps the most precious were individual privacy and human dignity.

One of the principal reasons for my requesting this hearing and the investigation that proceeded, was to have this subcommittee consider how far scientific progress and bureaucratic efficiency has intruded upon these basic rights. I am specifically concerned with the fourth amendment of whether a person can take the fourth and not be denied his basic right to employment.

Taking the fifth has become a familiar practice, but we should be mindful that our Founding Fathers considered the fourth amendment to have greater priority than the fifth in the constitutional Bill of Rights. The fourth amendment to the Constitution states, among other provisions, that the right of the people to be secure in their persons, houses, papers and effects, against unreasonable search and seizures, shall not be violated.

Is not the fourth amendment violated if a condition precedent to employment is the subjection to a polygraph test, a test that seeks in some instances, and we seek testimony to this effect today, to determine not only the veracity but to probe the very thought process of an individual?

A preliminary investigation by this subcommittee has revealed widespread use, as Chairman Moss has pointed out, by the various agencies of the Government. It is my hope that the purpose of this hearing is to determine the extent and circumstances of the use of the polygraph in Government and to some degree, perhaps later on, in private agencies.

It is my hope that these hearings will guide us in setting some standards for the use of this instrument and to further establish some basic qualifications for operators. I have had called to my attention abuses that seemed to go far beyond the point of seeking confirmation of veracity through the use of polygraphs. Reports of attempts to determine attitudes, through use of the device, are most disturbing.

I have in mind here, Mr. Chairman, of the many calls that I have gotten and many of the letters I have gotten, such as a 17-year-old girl, just out of high school, who sought employment and was subjected to a lie detector test by the U.S. Government. This girl was asked many, many questions concerning not only her private life but her sex life.

She was subjected to questions that were most embarrassing and she suffered a humiliating experience, from which several years later she seems not to have recovered. This was brought to my attention by her mother, a constitutent of mine, and in probing the extent of this type of questioning I find that it is common practice in determining intent.

I just wonder why a girl applying, at 17 or 18 years of age, for a clerk-typist job in a governmental agency, must be subjected to this type of probing. I am wondering whether or not we are not defeating our purpose.

A typist or a plumber and the various people, for instance, in NSA, who are subjected to this type of polygraph questioning, they

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do not make policy. It is sort of paradoxical to me that the people at the top of these agencies are not subjected to this. Yet, we have people right out of high school who must subject themselves to this sort of questioning.

This girl, among other things, was asked—and I have four daughters and I know how outraged I would be if they were subjected to this line of questioning—if she were a homosexual. This type of questioning, this line of probing it seems to me, goes far beyond the need or intent to know whether or not a girl is qualified to take a GS–2 position in the U.S. Government.

This is but one of the many examples that have come to my attention. I think that this is one of the things that this subcommittee is concerned with. When you consider the appalling responsibility that an operator assumes in being judge, jury, and investigator, and interrogator of his fellow men and how he may influence this man's destiny, I think you will agree that the time is at hand to make sure that the operator is at least qualified and measures up to some standards, overall standards, set by the U.S. Government.

Be mindful that there are now no standards other than those set by the agencies using the polygraph, and in some cases, it appears that not even a high school diploma is required. With a very grave responsibility in evaluation that the polygraph operator assumes, this could possibly become part of the permanent record of the individual tested.

The old Christian concept of rehabilitation and starting life anew is no longer probable since a minor or major transgression must be constantly brought up for consideration and is neither forgotten nor forgiven even, no matter how long it may be since it occurred or how straight the path since has been traveled.

I have in mind here an example of this as part of the permanent record. An individual fills out a test for NSA. This should be a very confidential and private matter. It turns out later on that for some indiscretion in his youth he evidently did not get the job.

Yet, it has been brought to my attention that a year later he applies for a job in the Bureau of Census. There is no great security aspect in the Bureau of the Census. Yet this transcript appears for this man as he applies for a nonsensitive position. So no matter what we may say, the fact is that there is a very great probability of this transcript or the evaluation turning up at some later date in another area of our Government.

The investigation has led to the calling of this subcommittee hearing and has revealed some rather significant facts with respect to polygraphs by Government agencies. It shows that there is no Government-wide policy governing the use of the polygraph. There is no established standard for operators. There are no specifications, no overall specifications, for the machines, and no criteria for firms with which the Government may contract for polygraph services.

If we are concerned with an increasing tendency to invade the privacy of our homes through wire tap and other types of scientific and electronic instruments, let us be doubly concerned with the widespread use of these techniques that we speak of here today and these instruments that may be used, and perhaps are being used, to invade the privacy of a man's mind, which after all, is the most private of all sanctuaries.

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So, Mr. Chairman, I thank you and compliment you and your staff and this subcommittee for the excellent preliminary job that they have done, and I feel that you will render a great service to our Government if through developing in these hearings we arrive at some legitimate uses for the polygraph in the U.S. Government, and set some standards for its use, and set some qualifications for operators.

Thank you, sir.

Mr. Moss. Thank you, Mr. Gallagher.

The Chair would like to observe that the witnesses present today are an indication of the excellent cooperation the committee has received from everyone concerned with the use of polygraphs. I have been deeply impressed by the sincerity of those most deeply involved in their use in seeing that appropriate standards are evolved.

As these gentlemen make their contribution to the committee, I think it will become abundantly clear that we have many highly responsible persons engaged in this field, alert to its limitations, and desirous of seeking improvement. I believe Mr. Monagan, that you had some observations.

Mr. MONAGAN. Mr. Chairman, it is not exactly clear from Mr. Gallagher's remarks to what extent these incidents relate to the polygraph, although apparently some of them do. I would like to suggest that the specific information that he has, the communications, and so forth, be made available to the committee, so that the staff may determine whether or not it is advisable to take further steps in investigating these incidents.

Mr. Moss. We will consult with Mr. Gallagher for the specific documentation on that.

Mr. GALLAGHER. In reply, Mr. Chairman, all of the incidents that I have mentioned relate directly to polygraph testing.

Mr. Moss. Will you gentlemen stand and be sworn?

Do you, and each of you, solemnly swear that the testimony you are about to give this subcommittee shall be the truth, the whole truth, and nothing but the truth, so help you God?

TESTIMONY OF FRED E. INBAU, NORTHWESTERN UNIVERSITY SCHOOL OF LAW; ACCOMPANIED BY JOHN E. REID, JOHN E. REID & ASSOCIATES, CHICAGO, ILL.; AND GEORGE LINDBERG, JOHN E. REID & ASSOCIATES, CHICAGO, ILL.

Mr. INBAU. I do.

Mr. REID. I do.

Mr. LINDBERG. I do.

Mr. Moss. Will you identify yourselves for the record?

Mr. INBAU. My name is Fred E. Inbau. I am professor of law at Northwestern University.

Mr. REID. My name is John E. Reid, director of John E. Reid & Associates in Chicago, Ill.

Mr. LINDBERG. My name is George W. Lindberg, associate director, John E. Reid & Associates, Chicago.

Mr. Moss. The members of the panel have been given a series of questions as a basis for their comments.

Mr. Kass, will you start the proceedings at this point?

Mr. KASS. Mr. Inbau, could you tell the committee for the record the part that the polygraph plays in the detection of deception.

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Mr. INBAU. The instrument itself, and that is what you are referring to when you label it "polygraph," plays a rather minor role in the conduct of a lie detector or polygraph tests. There are several instruments available commercially, some with few advantages over the others, but almost any one of the polygraphs—and by that we mean an instrument recording such things as respiration, pulse, blood pressure, galvanic skin reflex, muscular movements, instruments of that sort, not just one but a many tracing instrument—the instrument itself does not reveal the lie.

There is no bell that sounds, no whistle goes off when a person lies. It is merely an instrument which serves as a basis for a technique for diagnosing deception. Consequently, the technique is no better than the man who is making the diagnosis. Just as with any medical instrument, it is of no value, in fact it may be a very dangerous thing in the hands of someone who is not trained in the technique of making the diagnosis.

This brings me to the point that I know you want answered in one of these questions here, as to what kind of a man should be conducting the test. The individual must be someone with a good educational background, something comparable in our opinion to a college education.

It is implicit from what I just said he must be a person of intelligence, and some degree of maturity. He also must be one that can measure up to what Mr. Gallagher has just been insisting upon, and I agree with him completely, someone who also has a sense of values so that he is not only seeking to protect the public interest, the Government security, but who is also respectful of the rights of the individual.

Someone who has less than these general qualifications I have just outlined is much more likely to do what Mr. Gallagher said when he referred to the 17-year-old girl than someone who has the intelligence, the educational background, and the adequate training to utilize this technique.

Not only must he have these basic qualifications, but in my judgment, and I know Mr. Reid and Mr. Lindberg agree with me on this, he must have had an adequate period of training under someone who is experienced and skilled in the technique. This is something that cannot be acquired, in our judgment, by someone going to a school where he is going to listen to lectures as a member of a group for a period of a few weeks, learn how to take the instrument apart, put it back together, run experimental tests on each other.

He must, in our judgment, have learned it my way of what we may call an apprenticeship technique, working under the guidance of someone who has a considerable volume of business of cases, conducting cases himself under the supervision of a skillful examiner, studying the records that this particular instructor may have available, and constantly reviewing the developments, and also observing cases being conducted by this examiner and others who are experienced.

In our judgment only in this way can someone acquire the skill that is required. I would like to go back, if I may momentarily, to a point Mr. Gallagher made. In the technique as we are accustomed to its use—and I refer there to Mr. Reid and his group and Mr. Lindberg—you don't do, Mr. Gallagher——

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Mr. Moss. Pardon me just a moment. The Chair regrets that the rules of the House of Representatives as interpreted by the three most recent Speakers, and the rules under which this committee must operate, do not permit the taking of pictures during the time of an active hearing.

The Chair will be willing to accommodate photographers at the beginning or at the end of the hearing, but there shall be no taking of pictures in this room in violation of the rules. It is not up to the Chair to state whether he agrees with the rules, but he is bound to enforce them.

You may continue.

Mr. INBAU. An examiner with the qualifications and the training and skill that we have been trying to outline will avoid the sort of things that Mr. Gallagher has mentioned. Taking a 17-year-old girl and make an exploration into her sex and personal life to that extent is not necessary in our judgment, in any sort of a security operation.

There are times with the more mature people when an inquiry of that sort may be highly appropriate. I have a feeling that not only should we be mindful of the rights of the individual as prescribed in the fourth and fifth amendment, but as Mr. Gallagher and all of you gentlemen know, there is a preamble to the Constitution in which it is stated that one of the purposes of it was to protect the public welfare and insure domestic tranquility.

It seems to me that this technique has a very vital role to play in governmental security operations. It can be used for that purpose without infringing upon the rights of the individual to the extent that the case related illustrates.

Also, as part of this technique, as Mr. Reid and his associates are using it in Chicago, there is a degree of confidentiality that ought to be part of the utilization of this technique. In other words, that not only is the individual himself and his sensitivity protected to the extent that is not required by the particular investigation, not only must that sensitivity be protected, but also the confidentiality with respect to various disclosures.

There is a practice among certain examiners in private industry whereby they proceed to squeeze someone for something of an embarrassing nature, something by way of some indiscretion so it can be reported to the employing agency, to indicate that this examiner knows how to come up with something even though he may be very vague as to whether this person is responsible for the thing that is under particular inquiry. The technique in my judgment is a very valuable investigative aid.

I think in view of the security measures that must be taken by the Government, it is an indispensable investigative aid. But again, I say that the agency using it must be respectful of the rights of the individual. I don't think there is anything incompatible about this. You can conduct the examinations very adequately without encountering such objectionable practices or without utilizing such objectionable practices as Mr. Gallagher has referred to.

Perhaps I have gone beyond answering this first question. I can proceed, or make myself available for whatever questions the committee may have.

Mr. KASS. Mr. Reid, I would like to ask you at this point if you feel that the polygraph testing technique is a scientific technique.

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Mr. REID. Mr. Kass, as we use it in our laboratory—and I am talking about technique as the professor stated here a short while ago—the technique we use is a diagnostic technique wherein the lie detector or the polygraph is used clearly and definitely without any interrogative assistance.

The leads and the direction come from the examiner's interpretation of the responses obtained, and the interrogation follows that with the aim of obtaining a confession, if that is the aim.

So the instrument does stand in itself, together with the technique, as a diagnostic instrument giving the examiner the leads as to what points he should look for.

Mr. HARDY. Mr. Chairman.

Mr. MOSS. Mr. Hardy.

Mr. HARDY. Mr. Chairman, I wonder if I could inquire of Mr. Inbau in connection with a statement he made right at the end, how we safeguard this situation.

As I understood it, Doctor, you said in effect there is nothing incompatible with the use of the polygraph and protecting individual rights. I realize those were not your words, but that is the way I interpreted your statement a few moments ago.

Mr. INBAU. I had reference particularly to the type of case that Mr. Gallagher mentioned. Obviously, when anyone is subjected to this test there is some invasion of privacy. Of course, one basic safeguard against that is that it is not forced upon an individual. It is a test he will voluntarily submit himself to.

Mr. HARDY. The question of incompatibility, as I understand the rest of your testimony, revolves around the competence, the education, the intelligence, maturity, and the sense of values of the person who is administering the test. Is that the basis on which you determine that the use of a polygraph is not incompatible with protecting the rights of the individual?

Mr. INBAU. Yes.

Mr. HARDY. That being the case, and I don't find any area of disagreement on this thinking, the possibility of actually arriving at adequate protection of the individual in our bureaucratic system is difficult. So many of our procedures are no more equitable than the people who are enforcing them.

The question of competence or maturity or having a sense of values on the part of people who administer these tests, it seems to me, is a rather difficult thing to be sure of, is it not?

Mr. INBAU. That you do get this kind of set of qualifications?

Mr. HARDY. Yes.

Mr. INBAU. Yes, that is difficult. Let us face it, of the people who are utilizing this device today, in my judgment about 80 percent of them are not measuring up to what standards we feel are required.

Mr. HARDY. Don't we have a pretty difficult job—and I recognize the value of lie detectors in some activities that are tied to security—don't we have an extremely difficult job to decide who is able to use one of these things or give these tests on the basis of being completely objective, being able to submerge any personal ambitions? How do we do that? Isn't the human element insuperable? Isn't that the question?

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Mr. INBAU. I don't think so. In our book, Mr. Reid and I have outlined what we consider basic qualifications. It seems to me they are thoroughly warranted. Government agencies would be thoroughly warranted in establishing those as minimum standards.

Mr. HARDY. You can, undoubtedly, have basic qualifications insofar as education is concerned, and insofar as an individual's IQ is concerned, but how do you measure the moral fiber of an individual who is operating one of these things? That is one of the things that is difficult for me to understand. Isn't that the key to the whole thing?

Mr. INBAU. That is certainly part of it. Here again, I recognize that perhaps of all of these factors that is one of the most elusive. We find that true with judges, law professors, Congressmen, and everyone else.

Mr. HARDY. Unfortunately, we do. The judges when they come up with an edict: It is pretty serious to an individual if the judges should be biased or prejudiced. We Members of Congress, if we act on the basis of prejudice don't stay in very long. People have a way of getting rid of us and we haven't done too much damage. But where you have an individual whose whole life can be messed up because some operator of a polygraph had an ax to grind—that could be very important.

Mr. INBAU. Don't you have some control, such as you have just outlined with respect to Congressmen? This individual can be removed from his assignment. I think this ought to be borne in mind, too. We are always looking upon this technique as one that gets people in trouble. Mr. Reid, in his work in Chicago, has gotten innocent people who were caught in a web of circumstances out of trouble far more often than he has gotten guilty people into trouble.

I would like to give you, if I may, one example of that, because it has an important bearing on this. An individual may be caught in a web of circumstantial evidence by which he cannot extricate himself by any of the conventional methods. This is one way in which to do it.

I would like to cite a recent experience of theirs about a year and a half or 2 years ago, as I recall. A bank in Chicago was experiencing a series of losses from the tellers funds. Every time the auditor came in he found a few of these tellers short in their funds.

It happened with such frequency that the bank fired this group of tellers and got new ones replacing them. The next time the auditor came in, the same thing was happening. At this point the bank employed the services of Mr. Reid to make some tests on the tellers and he found out that these tellers were not responsible for the shortages, and he suggested that the auditor be asked to take a polygraph test.

The auditor took it and he admitted he was the one who was taking the money that was causing all these innocent people to be fired. He was later prosecuted in the Federal court and I think he pleaded guilty to the charge. Am I correct in that?

Mr. JOHN REID. Yes.

Mr. INBAU. We should not lose sight of the fact that there are many times when an innocent person is in a hopeless situation to establish his innocence and this is one way to be done.

Mr. HARDY. I think I appreciate that. I don't want to get off your line of thinking. In an organization as big as the Federal Government, we all too often rely very heavily on mechanical yardsticks to measure the human individual, and it is a little difficult to do.

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I can't think of any area of employment where it is more important that we have an accurate measurement of an individual than of a fellow who is going to run one of these polygraph machines. When he runs his tests he can explore any avenue he chooses maybe his maturity and education and intelligence lead him into some particular area, he comes up with a finding and that goes into the subject's personal jacket and it stays in there. You don't get them out.

Mr. JOHN REID. Mr. Hardy, he is subjected to a polygraph test himself. I understand the Government does and we do it with our examiners before we choose them. That should take care of some of the integrity that we seek in the individual that may be subjected to these standards.

Mr. HARDY. Is he subjected to a polygraph test with respect to the test he has just conducted?

Mr. JOHN REID. He is tested prior to his employment in the Government and he is also tested prior to employment in my organization.

Mr. HARDY. That might help for the time being and as it relates to a particular situation.

Mr. JOHN REID. But the measurement is a lot greater than in the choosing of other public officials when we choose polygraph examiners in that manner. We are adding one additional thing. We are not subjecting the employee to a technique that the examiner himself was not subjected to.

Mr. HARDY. So you are going to determine his sense of values, his sense of morality, his objectivity, in the beginning by giving him a polygraph test and then you are going to know that is going to stand up all the way through his performance. That is what bothers me at this point.

Mr. INBAU. Mr. Hardy, that would be only one part of it. There is no denying the fact that the selection of this examiner must be done very carefully, and with this particular facet of his personality in view. Also, we are suggesting here, at least we can suggest now, that these examiners ought not to be permitted just to roam around on their own making these decisions all the time without some checkup on them.

It seems to me the head of the particular agency, or someone acting on his behalf should keep a close control and watch on the operations of these people. If he finds one who develops some sadistic tendencies or gets off balance in some other way, it seems to me that he ought to be subjected to removal. That should not be much more difficult here than in other governmental functions where you have people in very sensitive positions making these very sensitive decisions. I can conceive of someone in the State Department or any other branch of the Government——

Mr. GALLAGHER. Mr. Chairman, may I interject before we get off on another tangent?

Mr. Moss. Mr. Gallagher, the Chair regrets—he is very pleased to have you sit with the committee and will afford the maximum opportunity within the rules for you to participate—he cannot recognize you for questions.

Mr. GALLAGHER. It was my understanding, Mr. Chairman, that as a member of the Government Operations Committee that I would be allowed to sit with this committee and participate as a member. I was in the process of following up a question of Mr. Hardy.

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Mr. Moss. It would have to be by unanimous consent. The Chair is not attempting to restrict the gentleman.

Mr. GALLAGHER. I ask unanimous consent.

Mr. HARDY. May I comment on this, because I am pleased that Mr. Gallagher is participating. I have been through some recent experiences of this same nature. I would be glad for him to follow up on my questions. In fact, I am ready to yield the floor.

On this question of permitting other members of the committee to interrogate witnesses during a subcommittee hearing, I would have some reservations about the wisdom of doing it because of the problems which might be created. I would say this, that if Mr. Gallagher has specific questions, I am sure that any member of the committee would be glad to pursue them on his behalf.

Mr. Moss. There is a unanimous-consent request.

Mr. HARDY. Mr. Chairman, I would have to object to that. I am sorry. There is nothing personal about it at all, but I think from a procedural standpoint, it would not be desirable.

Mr. GALLAGHER. Mr. Chairman, may I make a statement. I am a member of the Government Operations Committee and a member of the Foreign Affairs Committee. Every time we invite other Members of Congress to sit in we allow them the various courtesies. It was as a result of my interest that this committee is meeting here today.

It would seem to me if we are just going to casually allow these witnesses to present their views, then I don't believe that the committee is following the mandate of Chairman Dawson who suggested that we get into this subject. If we are just going to go through a pro forma performance here today, and if Mr. Hardy feels that there should be no questioning, I am not quite sure what the purpose of the hearing will be.

Mr. Moss. The Chair is going to have to terminate any discussion or disagreement between the members. The Chair did not write the rules under which the committee operates. The Chair is bound to enforce those rules and those rules are very specific and they are specific for a very significant reason.

In the course of any hearing where you have witnesses, there could be a point at which you are forced to instruct the witness to respond. Under those conditions, it would have to be a question by a member duly appointed to the subcommittee. Also, the time limitations require that the members of the subcommittee be accorded the fullest of opportunity to explore their questions.

As Mr. Hardy has indicated, I think any member of the subcommittee would be willing to pursue your questions. The Chair will, at the beginning of a session or at the end, attempt to accommodate the gentleman, but within the limitations imposed on him by the rules he has no alternative where unanimous consent has been withheld.

Mr. HARDY. Mr. Chairman, may I make just one other observation. I have recently been through this same problem in another committee. I regret to object, but I think in the interest of protecting the committee against further problems, it is the only thing to do. I have no objection at all to Mr. Gallagher pursuing any subject he wants to pursue, but I think if we start that we will be in trouble from now on.

Mr. GALLAGHER. I did ask unanimous consent.

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Mr. HARDY. I understand you did, and I objected because I think every member of the committee ought to object. If the other members of the committee want to pursue it in that manner, I have no objection, Mr. Chairman, to absenting myself.

Mr. MOSS. The subcommittee will continue in regular order.

Mr. GRIFFIN. Mr. Chairman, may I make a brief observation?

Mr. MOSS. Mr. Griffin.

Mr. GRIFFIN. All of us have before us a list of questions which the staff has prepared, and we have some very able witnesses here today who shall, as I understand, present some type of an educational forum. I know I come to the hearings with some preconceived ideas and some definite opinions, but I think it would be well if all of us could withhold opinions and restrain ourselves in asking questions until the questions prepared by the staff have been discussed by the panel. It is just a suggestion. Our time is short. I would like very much to hear what these people have to say.

Mr. MOSS. I think it is an excellent suggestion, one that the Chair concurs. Before we proceed with the next question or continue the discussion, I would like to swear Mr. Cleve Backster of the School of Lie Detection, of New York.

Do you solemnly swear that the testimony you are about to give this subcommittee shall be the truth, the whole truth, and nothing but the truth, so help you God?

TESTIMONY OF CLEVE BACKSTER, BACKSTER SCHOOL OF LIE DETECTION, NEW YORK, N.Y.

Mr. BACKSTER. I do.

Mr. MOSS. Will you identify yourself for the record.

Mr. BACKSTER. My name is Cleve Backster, New York City.

Mr. MOSS. Mr. Kass, will you continue?

Mr. KASS. Mr. Reid, will you expand on your comment that the polygraph is a diagnostic technique.

Mr. JOHN REID. Yes. The polygraph is one where, in our technique, the questions are read to the subject beforehand. If there is any objection to the questions, the person could object to them at that point. They are discussed and understood by the subject and they are unambiguous so that they don't have any two-way answers. It is a comparison of responses.

It is a scientific evaluation of the different reactions of the subject. We compare relevant questions with control-type questions, and we establish a normal by using known-truth questions. An examination consists of several tests and there are only about nine questions in each test. There are at least five tests that we make our evaluation from.

So, the comparison of the responses is what indicates to us that the subject is either withholding information from the examiner or is telling the truth. The control question technique was developed by myself in 1947, and introduces a lie in the polygraph chart to establish a yardstick so that we would know what the reactions really mean.

If the person responds to this control lie to a greater extent than he does to the actual questions under investigation, we assume and establish the subject is telling the truth at that point. If the reverse is true, we state that he is not telling the truth at that point.

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Mr. LINDBERG. I might add, if I could, just by putting the diagnostic concept of a polygraph test in its proper perspective, our analysis of the polygraph field as it exists today would make it appear that there are basically two concepts abroad in the land as to the methodology and the purpose of a polygraph test.

For the sake of accuracy and brevity, I will just read the few lines I have prepared on this point by way of definition so that we understand. The interrogative concept, which is the opposing concept, is one wherein the test is used primarily to induce a confession.

This procedure is very common among examiners who only have a few weeks training. This technique emphasizes the value of the polygraph in obtaining confessions. Seldom, however, can its advocates clearly and reliably determine that a subject is either truthful or deceptive unless he has obtained a confession from someone in the case.

The diagnostic concept, however, considers the polygraph procedure to be primarily for determining truth and deception scientifically through the course of several examinations without any earmarks of traditional interrogations. Such a technique is capable of a decisiveness factor of better than 90 percent.

In other words, we can make decisions in better than 90 percent of the cases tested, and an accuracy capability of less than 1 percent error in those 95 percent. As a matter of record, I thought that might be important.

If I might add one other point with regard to Mr. Gallagher's well founded concern and that of Mr. Hardy. The issues which are undertaken during a security polygraph examination are no different than they were before the advent of the polygraph, I presume, in Government security clearances. That is, the same roster of questions was tolerated by the Government prior to the war and during the war, that now exist.

The advent of the polygraph as a device to arrive at a more precise determination is a secondary issue. The primary area would be to delimit the scope of the inquiry which Federal agents are allowed to discuss with a subject.

Mr. INBAU. Not only allowed, but I presume in many instances this kind of exploration is required. For instance, homosexuality in a sensitive position, as Mr. Lindberg said. If this is the policy of the agency to explore into this, presumably the polygraph examiner has to do so, too.

Somewhere along the line it seems to me, you could make some sort of delineation so that you would not run into the factor of subjecting a girl right out of high school who is going to be a typist in a nonsensitive position, to this kind of inquiry.

On the other hand, if someone is going to be put into an ultrasensitive position, and is a mature individual—certainly by nature, beyond the tender age of 17—it seems to me it might well be worth this sort of inquiry, but it could be done in a sufficiently delicate fashion so that it would not have the offensive tinge that it has had, I am sure, in times past in certain situations.

Some years ago, I remember when Senator Morse became very much incensed, and rightly so, to the use of what was then known as a personal embarrassing question where the individual in a case that

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had nothing to do with the sex involvement, would be asked the question that would provoke some shame on his part. It was very offensive to people.

I wrote an article which was published in the Journal of Criminal Law, Criminology and Police Science condemning this sort of practice. I think it is important to know that those of us who have a vital interest in this technique certainly share the views of some members of the committee that you have to avoid this kind of an insulting inquiry. But the test can be done without running that risk.

Mr. KASS. Does that mean that personal type questions would never be asked?

Mr. INBAU. You may ask some. For instance, the control question Mr. Reid refers to, where an individual is being questioned with respect to the loss of $10,000, you ask him as part of a control, if he ever had stolen anything in his life. You get this individual in a position where he will somewhere along the line, say "no" and either it will be a lie or he will be concerned about the complete truthfulness of his answer.

So, you have something there to use as a control for comparison with what happens or what doesn't happen when you ask him about the $10,000. So, you have to get into some of this. You can't completely avoid it. What I am saying is it can be done discreetly and quite inoffensively.

Mr. JOHN REID. The disclosure that the subject may make regarding the control question is never made part of our report. That is for our own evaluation.

Mr. INBAU. This may avoid the thing that Mr. Gallagher was concerned about. For instance, in questioning someone about a particular incident of a very serious nature, you use something of the sort I mentioned as a control, but if this individual then tells you "Yes, I stole a bicycle as a kid, I stole from an employer I worked for during the summertime when I was in school," that is not divulged to the employing agency.

The examiner keeps that to himself. He should. There is no reason on earth in putting this sort of thing in an individual's record. You want to know whether he is responsible for this particular incident or not. If he is not, these other things become totally irrelevant.

Mr. HARDY. Mr. Chairman, I hate to interrupt on that, but this raises a question that seems to me is important to try to settle at this point. You are speaking now of the employer not being advised of this control question or the reaction to the control question. Do I understand you correctly?

Mr. INBAU. The disclosures that the individual makes following the test, or when he is asked before the test, "this is the question I am going to ask you, have you ever stolen anything in your life?" And he says, "I stole a bicycle in high school and I stole $5 when I was working for some company during the summertime." This is not disclosed and made a part of the record.

Mr. HARDY. I don't understand the ground rules that are involved here now, but I have a hard time understanding how you would have this kind of a withholding by the operator of a polygraph in one of the military establishments, for instance. I would doubt very much that it can be withheld.

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Maybe what you are saying and maybe what I am understanding is that the polygraph ought to be operated by somebody completely independent of the chain of command.

Mr. INBAU. He may be responsible to someone in a higher position, but it seems to me this is one of the ground rules that ought to be laid down.

Mr. HARDY. That is real fine, but if you find any situation in the military that is not susceptible to orders from the chain of command. I don't know where you can find it, and I have been monkeying with this subject for a long time.

Mr. INBAU. You are in a better position to judge than I am. All I am saying is that if the military is going to use this particular technique, they ought to be willing to accept this limitation.

Mr. HARDY. That is the problem that bothers me about this. If you could maintain complete objectivity and separate the operation of the polygraph from the administrative agency itself, you might be getting somewhere. But even the inspector general is susceptible to the chain of command.

Mr. LINDBERG. Mr. Hardy, if I might give you a suggestion. We conduct polygraph examinations of Chicago policemen for the Chicago Police Department. In each of those instances, the issues are clearly defined. There is a delineated group of questions which we, as examiners, are responsible for giving our opinion about as to the subject's truthfulness.

We have never had an incident where we have been challenged for violating the confidentiality of disclosures that a policeman may make to us regarding some wrongdoing. It seems to me that your suggestion that the examiners be responsible to only one authority and not to the various agencies might be a good one.

In other words, a central pool of polygraph examiners.

Mr. HARDY. Don't misunderstand me. I don't feel I am in a position to make such a suggestion. I might observe in the position you outlined, you were not susceptible to the administrative control of the people you were working for.

Mr. LINDBERG. Perhaps polygraph examiners should not be either.

Mr. INBAU. He regards the superintendent of police in Chicago, all he wants to know when he sends these suspected policemen to Mr. Reid's office is, "Is he guilty of this bribery or not?" If, in the course of the testing, whether he committed this bribery, this individual policeman tells about other things he has done, it is understood and this is one of the ground rules, that it is not going to be reported. It is not going to get into this file.

Mr. HARDY. I didn't mean to get off the track, Mr. Chairman.

Mr. JOHN REID. I think one thing should be clarified——

Mr. GALLAGHER. Mr. Chairman, may I breach the veil of silence for a moment? I think Mr. Griffin had an excellent idea that we do listen to the witnesses. However, Mr. Hardy raises these new lines of questions and my name gets mentioned in the pursuit of this questioning, and I am wondering whether or not the veil will continue to be imposed if a line of questioning begins at which my name has been mentioned.

Mr. Moss. Mr. Gallagher, I will have to rule that out of order. The committee will be pleased to meet in executive session for a discussion

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of this issue—refer it to the chairman of the full committee—but this is not the forum, this is not the time for this discussion to continue. The Chair is not going to permit it to continue. The counsel will continue in order.

Mr. GALLAGHER. May I ask one more question, please?

Mr. MOSS. No, sir.

Mr. GALLAGHER. May I submit a series of questions that I would like to have the Chair ask?

Mr. MOSS. You may discuss the matter with the Chair. We will proceed now in regular order.

Mr. GALLAGHER. Fine.

Mr. KASS. What qualifications and abilities should a polygraph examiner have, Mr. Backster?

Mr. BACKSTER. As to the qualifications, I feel like an orphan. The qualifications that a polygraph examiner should have are those that involve an ability to create rapport with the subject, to make himself understood, and not resented by the subject by his very exposure to him, as much investigative experience as possible; of course, interrogation experience in light of what we have said before.

We have talked of investigative experience. We have talked of the fact that he must have interrogation capability or aptitude, where he doesn't create resentment in the person that he is talking with. He must have no physical attributes that would hamper his contact with the subject, such as stuttering and things which cause false emotionality, perhaps to show up on the charts during an examination.

He should have a desire to want to become a competent polygraph examiner and enter deeply into this field that is far beyond the call of duty, so to speak, of the 40-hour week or the 8-hour day, because he will find himself in predicaments that do require many more hours than that, because he cannot stop in the middle of a dilemma or examination. If he were to stop, he would lose the effective necessary of the situation.

These are a few. There are many characteristics. I think this is a little opinionated as to the individual who is analyzing the situation.

Mr. KASS. Mr. Reid, can an individual beat a polygraph instrument?

Mr. JOHN REID. Actually, Mr. Kass, the more effort he makes to beat the polygraph, the more he beats himself. If he makes overt movements or secretive movements, we are able to detect that. We have now learned to evaluate those as deception points. We have proven these to be deception points by our interrogation and confession later.

Mr. KASS. Therefore, it is never possible to beat the instrument?

Mr. JOHN REID. When the subject makes the effort to beat it. I don't believe he can. But if the subject is of a low mentality, there is a good possibility that he may very well show no response in a test whatsoever, and therefore, to an examiner who is leaning toward the innocent, he may very well say that he is telling the truth.

However, in our technique, we feel that we cannot make an evaluation where we cannot compare the responses between one and the other and there are no responses whatsoever. We would relegate many of these to the inconclusive class and would not make a determination at all.

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Mr. KASS. You discussed the low mentality of an individual. Are there any other mental or physical defects or characteristics of an individual which would render one incapable of taking a polygraph test?

Mr. JOHN REID. Yes. Of course, with regard to anyone with a mental or physical defect, there is a possibility that he may show an indefinite reaction on the test or an emotional defect may also produce the same results. The danger or where we could fail is to not recognize a person who had a mental condition. We could make an error in that regard.

Mr. KASS. Do you give all subjects who take a polygraph test any type of intelligence examination?

Mr. JOHN REID. No, sir; not formally?

Mr. KASS. How do you recognize their mental defects?

Mr. JOHN REID. We spend 20 to 25 minutes with the subject prior to his test. We evaluate the speed with which he answers the inquiries that are not delegated for deception purposes but to determine his mental capacity. If he is talking completely strange to the questions asked, we suspect there might be something wrong.

If a person appears to answer these questions properly, and he reacts to a direct question in a manner that indicates he probably has some uneasiness about it, or a misunderstanding about the question, we certainly feel that man is mentally capable of taking the test. I think without formal aptitude tests we do, in the pretest interview, adequately learn this point.

Mr. KASS. You stated about bodily movements. In other words, you can detect all bodily movement that the individual subject is making?

Mr. JOHN REID. Yes. We have an instrument in our laboratory that I hold the patents to, that records all movements that the subject makes. Any pressures that he applies on his thighs or arms or pushing down his arms, that could affect or change the test record is recorded. We evaluate these in terms of deception afterward.

Mr. KASS. A recent study spoke about tensing or wiggling one's toes. Would this affect the polygraph chart?

Mr. JOHN REID. It would not affect it particularly because we establish the blood pressure normal to start out with. If we note that the tensing of the toes or some tensing of the muscles has been entertained, the blood pressure record would start at a higher rate and, therefore, we would suspect something wrong, and we would insist on his relaxing.

Mr. LINDBERG. I might supplement that, Mr. Kass, by suggesting that guilty subjects, based on the review of our work, adopt one of two methods of getting through a lie detector test. They either sit very quietly and cooperate and they are detected through emotional responses, or they make defensive efforts, such as the muscular movements that you are referring to, so as to, you might say, "tilt" the machine. This is probably the more primitive method of beating the test. The value of the movement recorders is very important in that detection.

Mr. KASS. Can you test a person secretly? In other words, where he doesn't know that he is being tested.

Mr. LINDBERG. We believe not.

Mr. KASS. Why not?

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Mr. LINDBERG. Because the subject is not under the same situation, for example, that a witness is in when he is on the witness stand; namely, a compulsion to tell the truth. On the witness stand, the laws of perjury are the compulsion, and in the lie detector environment it is the fear of detection or concern about detection that conditions the subject to respond during a polygraph test.

Obviously, the innocent person does not have these fears, or at least such apprehension to induce a disturbance on the polygraph record.

Mr. KASS. Mr. Backster.

Mr. BACKSTER. Yes, Mr. Kass. On this last point that we left suddenly, can movement distort the records or can movement cause the person to beat the polygraph. There is an important factor which I think needs to be emphasized here, that the lack of response and not the presence of response is the dramatic and impressive thing in chart interpretations.

In the technique that we are talking of now, Mr. Reid's technique, and my technique, which is similar, and is based completely on the two elements of Mr. Reid's technique; namely, a question to stimulate the innocent and a question to stimulate the guilty. This person should respond to one or the other of these two questions, but the lack of response on the relevant question, and the presence of response on the question to stimulate the innocent individual, means that the person must go through the relevant questions showing no response.

Many people can create response in different ways. But we are not impressed by the presence of response. I know of no way to create a lack of response when a response should be present. So if we are impressed by lack of response rather than presence, I think we have something. In fact, research has certainly shown that.

Mr. KASS. Mr. Inbau, if a person doesn't have any faith in the polygraph, if he doesn't feel it is very accurate or feels it is not completely infallible, will the polygraph still produce the desired results?

Mr. INBAU. He has got to have some fear of having his lies detected by this technique. He has to have some respect for it. That is why, as Mr. Reid pointed out before, you take an individual who is unintelligent and uneducated, he may not appreciate the fact that when he lies, he may get some internal disturbances. He may be an individual who by reason of his cultural background or what have you, just may not have any sort of internal disturbances.

It is a person like that who is most likely to go through a test without having his guilt detected. Although in this pretest interview that Mr. Reid described, and general observations of him, and you can conduct some controls on him, you know he is this kind of individual and very likely you will report him as indefinte rather than as telling the truth or lying.

So, there is some built-in control in the technique to safeguard against this. But more specifically, in answer to your question, if the individual doesn't have this respect for the technique, respect for the examiner, he will not be responsive. This can be created in the pretest interview with the individual.

You can do it with the running of a card test, which is part of the Reid technique. It is the second in a series of tests. So along the line, you will stimulate a response with respect to the control questions in the innocent and stimulate a response in the guilty questions, the relevant questions, with respect to the guilty.

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I think it ought to be pointed out here, this is not a matter of a one test shot deal. You have at least three tests as part of the entire examination. In some instances, even more beyond that. Because only—I think these are Mr. Reid's figures, if I may use them—only in about 25 percent of the cases can you spot it in the first three tests, so that anybody could appreciate the significance of the responses.

In about 65 percent of them, it calls for additional testing and skill on the part of the individual who is conducting the test. I think Mr. Lindberg may have something he may want to say by way of supplementation.

Mr. Moss. At that point, I would like to ask a couple of questions.

When you have referred to lack of response as indicative of low intelligence or lack of education, could it also occur in a highly intelligent, well-educated, but somewhat amoral person?

Mr. INBAU. He may be immoral.

Mr. Moss. Amoral.

Mr. INBAU. Or amoral, about a particular thing, but at the same time, he has some concern about being caught at it.

Mr. Moss. What happens about the highly nervous person who perhaps has extremely rigid standards. Perhaps a very severe guilt complex?

Mr. INBAU. I would like to refer that question to Mr. Lindberg. I think he will have a satisfactory answer, Mr. Moss.

Mr. LINDBERG. The apprehensive or overly nervous subject is probably our best subject by reason of the fact that the control questions are even measurably more significant to him if he is innocent on the relevant issues than they would be on the average low intelligence person.

In other words, we would expect a more dramatic reaction on the control question if he was telling the truth on the issue question or the hot question, as we refer to it. So he is our best subject, the high-strung person.

Mr. BACKSTER. May I comment on the nervous person point? Nervousness as a condition shows up in a pattern. In other words, a set distortion on the charts. A uniform distortion. A distortion, yes, but in a uniform sense throughout the chart. We will utilize that as somewhat of a norm and will look for deviation up and beyond this usual distortion pattern that we are getting. It is no great problem because everyone is nervous that takes the test. They always have been and always will be, very likely. The very first thing we had to do is circumvent any problems created by nervousness alone.

Mr. Moss. Now, what you gentlemen are setting forth here is your views as to the minimums required. You indicated, Mr. Inbau, that at least three examinations are required, so you are not normally relying on just one run through a polygraph.

Mr. INBAU. Three tests as part of the examination. They can be at the same time interval.

Mr. Moss. So what you are really spelling out are certain minimums in procedures.

Mr. LINDBERG. Yes, sir.

Mr. Moss. Mr. Reid, you have a patent on an added machine that detects all bodily movements?

Mr. JOHN REID. Yes, sir.

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Mr. Moss. Do you feel that this type of additional—it really is an expansion of the polygraph, you are adding more graphs and more readings——

Mr. JOHN REID. That is right, sir.

Mr. Moss. That this is essential to a more careful diagnosis, a more meaningful diagnosis?

Mr. JOHN REID. Yes, sir.

Mr. Moss. How widely are these machines used in the area of concern to this committee, the Government of the United States?

Mr. JOHN REID. I think they are hardly used at all. Our instrument is not used in the Government at all.

Mr. Moss. Then the question of adequacies of methodology in Government and adequacies of equipment would automatically arise if you feel that there is a need for this additional type of measurement?

Mr. JOHN REID. Yes, sir.

Mr. INBAU. I think in all fairness, it can be said that you can detect some of this, at least safeguard against it, without necessarily using this particular device.

Mr. LINDBERG. This instrument makes a permanent record of that effort. That is the important thing.

Mr. JOHN REID. I agree with Mr. Inbau that it is not necessary or absolutely necessary in all cases. But it is the cases where the secret muscular movements are applied that is the most significant to us and that is where it is the most important.

Mr. Moss. And this is the element that is ordinarily lacking in Government testing?

Mr. JOHN REID. Yes, sir.

Mr. INBAU. I was asking Mr. Reid a question here. I thought I knew the answer to it. I am sure that the mere fact that he patented this wouldn't mean that he wouldn't want the Government to have it, even perhaps with their own devices and so on. I think in all fairness, he doesn't stand here to tell you——

Mr. Moss. I don't want it inferred that this is being held tightly as a monopoly in the office of John Reid & Associates.

Mr. KASS. Mr. Reid, if the subject is so convinced that the instrument is infallible, is it not possible that he will resign himself and thus in effect, cease to be excited by the polygraph exam and therefore, there will be no response?

Mr. INBAU. That is a possibility. That is pretty rare. Sometimes you find on the third test after you have run him on the so-called card test, he knows or he assumes it is working on him, he may then be resigned to the fact that he is guilty and on the third test you may not find any response. It is possible, but it is a very rare occurrence.

Mr. LINDBERG. In the majority of situations that would be contrary to human nature. There is always the instinct for self-help and preservation. We find in the majority of the cases a guilty subject becomes more responsive as the test proceeds.

Mr. Moss. You are dealing here with physiological and psychological answers. The graphs themselves are physiological readings; are they not?

Mr. JOHN REID. Yes, sir.

Mr. Moss. The physical condition of a person, what significance has this in taking these physiological readings and interpreting them as evidence of guilt or innocence?

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Mr. REID. It is most important that the person is in a reasonably proper physical condition at the time they take the test. They can't be overinterrogated. They have to have a sufficient amount of sleep the night before, and a number of items. I recall of a sheriff bringing a subject in to me for a test one time, just to make the point, where he and two others had broken out of the jail.

One man was shot on the way out and killed. The other man was captured. The third man that I finally got as a test subject was brought to me. It was after he had been on the run for 24 hours and they had pulled him out of a sewer. He was hanging by his hands, suspended in a sewer.

They brought him in. I think they had washed him out of the sewer. They shot a lot of water at him and drove him out of the sewer. He came, in almost that condition, for the test. I asked the sheriff if the man had anything to eat. He said, "I want to tell you something. This guy hasn't had anything to eat. He has not been able to go to the bathroom," and he said, "He hasn't had any sleep."

He said, "He is in perfect condition for your test." It kind of surprised him that I requested the prisoner be sent out, given a good meal, and a 24-hour rest and then had him brought in for a test.

Mr. MOSS. In our society today there is a very widespread use of antibiotics and tranquilizers. What effect have these medications on the subject of a test?

Mr. JOHN REID. Do you mind if I answer this, because we have some secret information regarding a particular case that we handled. It is for a certain group that we cannot disclose as to what happened. It came to our attention, after examining 80 subjects, that 75 of these men took tranquilizers prior to our test.

They made it a procedure before the test started. They would have to go to the bathroom and take some of these tranquilizers. They came back. We had the most significant responses from these subjects. They were responding greater to our technique than the ones that didn't take tranquilizers, because all they did was better condition themselves for the test and fear of being caught regarding their deception.

Mr. LINDBERG. They were all verified later.

Mr. JOHN REID. They were all verified guilty later.

Mr. MOSS. There are many types of tranquilizers.

Mr. JOHN REID. There are. I think from our investigation, from the pharmacology department at Northwestern University, in order for a tranquilizer to affect a subject and assist him in the test that he would have to take so much of it that he would be asleep. We have had such individuals in our laboratory where when they were left alone in the room, they were slapping themselves in the face and trying to keep awake, so they would be ready for the test, and when the test started they almost fall out of the chair. So we can recognize that trouble.

Mr. KASS. Mr. Inbau, is it possible to review a polygraph examiner's methods of operation?

Mr. INBAU. His general methods of operation? You mean appraise them or review his case?

Mr. KASS. Perhaps review his case in each situation.

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Mr. INBAU. That is a pretty risky procedure. Perhaps Mr. Lindberg could give you a better answer.

Mr. LINDBERG. I think the answer is "Yes," if the examiner doing the reviewing was trained in the same school of thought regarding polygraph tests. This is a very common thing—we do it as a practical matter with our 10 examiners on an everyday basis. However, just as cardiologists, neurologists, radiologists and these people in the medical profession have difficulty reading each others records, if they were schooled in different techniques, so also, polygraph examiners suffer that same limitation.

If the reviewer is versed in the technique that the particular examiner is using, there is no reason why he could not review the examiner's work and arrive at the same conclusion.

Mr. INBAU. Just to supplement that, for instance, in the Reid technique, there is what is called a stimulation procedure between testing. In looking at a record on the third test, if you didn't know what preceded it between the second and the third, and the first and the card test, you would be perhaps coming up with some false appraisal of it because it makes a big difference what may have preceded it in the course of the conditioning prior to the third test.

In other words, what Mr. Lindberg is saying is that he could appraise a record of Mr. Reid and vice versa, but someone else using a different test procedure, I don't think they want to make an interpretation from what charts he shows up with.

Mr. KASS. In other words, in many cases the examiner is on his own in making a determination of deception or no deception and actions can be taken as a result of this.

Mr. INBAU. Yes; I think that is true.

Mr. KASS. Without any review or safeguard for the polygraph subject.

Mr. INAU. The safeguards that would be meaningful would have to be of another nature and not this case-by-case appraisal. I think the only real safeguard is that you will have to get somebody who has the required skill and these other attributes we have been talking about, and then just keep check to be sure that he is utilizing the proper procedures and that his personality has not become warped somewhere along the line, and things of that sort. I think that is the only safeguard you really have.

Mr. JOHN REID. I think, too, Mr. Kass, that there are about 25 percent of the polygraph tests that practically anyone with some training can interpret, but 65 percent of these charts require the greatest ability to interpret. Sixty-five percent of them require certain additional techniques that Mr. Inbau referred to in making his comments before.

This 65 percent of them has to be properly developed in order for interpretation to be made.

Mr. INBAU. I think one factor that must be recognized here is that the less skill an individual has in this, the more he is inclined to use this as an interrogation prop. In other words, use the polygraph as an interrogation prop. This is why I think you run into so many of these instances of abusive practices, the insult to the individual and so on.

The polygraph or lie detector test itself is one in which the examiner is able, when he is through with these series of tests, to say, and with

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considerable assurance and a high degree of accuracy, this individual is lying or telling the truth without having interrogated him.

But if a person is not utilizing the proper technique, he will be inclined either before or after the test, to start interrogating everybody on the assumption he is guilty and only report those guilty who confess to him. That is not polygraph or lie detector testing as we view it.

Mr. REUSS. May I ask a question at this point?

Mr. MOSS. Certainly.

Mr. REUSS. Lying about what? Lying about the subject matter of the inquiry or lying about something else?

Mr. INBAU. Lying about the particular matter under investigation. If it is a preemployment screening device, then your objective has a broader base than in an isolated case where you want to find out whether this individual did or did not do this particular thing of which he is suspected or accused.

Mr. REUSS. I guess I should ask the chairman, I have a whole series of questions concerning my blank areas on the polygraph. They go into two categories. First, what is the real record of success of the polygraph in showing the guilty, guilty and the innocent, innocent.

There have been assertions made about it but I would like to explore that. The second major area of inquiry I would have would be what do people do with the results of polygraph tests? What do the results look like? What does the examiner say about them and what uses should be made of them?

I don't want to interrupt counsel, but certainly if this inquiry is to have any meaning, we have to bear on those two questions.

Mr. MOSS. The hearing this morning is primarily for the purpose of giving the subcommittee the benefit of the knowledge of the gentlemen before us, who are among the most actively engaged in this field in the Nation. They are recognized as authorities in using and the use of the polygraph. This is a part of a series of hearings where we hope to develop all facets of opinion on this. So those questions you have which would appropriately be directed to these gentlemen, we want to give you full opportunity to ask them.

However, the committee counsel has developed a line of questions submitted so that we would have full response on them, and it would be my hope that we would conclude that and then open it for the committee members questions. I know I have quite a series. I think all members will have.

Mr. REUSS. That is entirely agreeable to me.

Mr. KASS. Mr. Backster, would you briefly, without going into all of the techniques in here, explain the question of review which I think you were going to address yourself to?

Mr. BACKSTER. Yes. You mean review of the charts themselves or review of another person's charts?

Mr. KASS. Another person's charts. Is it possible to review the polygraph technique so that one individual examiner does not make a decision which then is applicable without anyone checking or reviewing or supervising him?

Mr. BACKSTER. Where a standardized system or approach is used, which certainly should be the case within the same agency and certainly one of the things which may be accomplished as a result of

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these hearings, perhaps a standardization among all agencies in the administration of a polygraph examination, is to avoid the saying, which for years we have heard that one examiner should not examine another examiner's charts or even look at another examiner's charts.

There is no reason in the world why he should not evaluate another examiner's charts. My answer to those people is, What are you trying to hide? If the same technique or a very similar technique is used and the same safeguards and a coded symbol system to indicate the environmental circumstances under which the tests were administered, then the other examiner has just as much of an opportunity to recreate the situation under which the test was given as does the original examiner who, after his memory may have failed him 6 months later and perhaps dozens or hundreds of cases later, used his same system to renew his knowledge of those circumstances that were involved. So it seems to be a question of standardization. There is no reason in the world why a person should not inspect another person's charts or review them. Every test I run is run on that basis. With the client's consent any three experts who are not motivated in my regard or in regard to the case, are free to go into each chart and see exactly how I arrived at the determination. It should be there.

Mr. KASS. Mr. Lindberg, would polygraph charts reflect the same responses where an actual crime or other type of offense has occurred and in a hypothetical situation which is merely created for the polygraph testing procedure?

Mr. LINDBERG. The answer to the question would not be that it is difficult, if not impossible, to simulate a situation upon which polygraph tests could be profitably, so to speak, conducted afterward.

For example, to say to a man, we are going to do some research and what we would like to do is have you lie about something during the test. We are going to see how our new technique works on this simulated or hypothetical deception. The experience of the field generally, and one of the reasons why universities have had so much difficulty in doing research in vacuo, so to speak, is the fact that they do not have the real live case situation. So the answer is that it is difficult to simulate the hypothetical case.

Mr. KASS. What about for training situations?

Mr. LINDBERG. Even for training. Other than for the purpose of giving the examiner or the trainee procedural instruction. It might be all right for that purpose. But not for the purpose of actually arriving at a decision of truth and deception. He would have to participate in the actual case environment, just as a surgeon does or an intern who has taken a 7-year residency in surgery.

Mr. KASS. Mr. Inbau, could you explain what is meant by a single reaction lie detector.

Mr. INBAU. I think what you have in mind is a so-called lie detector which consists of only one unit, galvanic skin reflex. It has been our experience over the years that used alone it is practically valueless in cases at large. It is the least reliable indicator of any on the polygraph and to rely upon that one alone is just as foolhardy an undertaking in my judgment. I understand one of the Federal agencies does it. I think it has been a mistake over the years to rely on it, if what you are seeking is to determine whether the person is lying or telling the truth. If you are using it as an interrogation gimmick you could use

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that or a mimeograph machine or anything to make the subject believe that this is detecting his lies. If what you are trying to do is detect deception and determine whether the person is lying or telling the truth, you need something more than a single unit, this so-called galvanic skin reflex.

Mr. KASS. Could you briefly explain for the record what galvanic skin reflex means?

Mr. INBAU. I will defer to Mr. Lindberg.

Mr. LINDBERG. Simply stated, the galvanic skin reflex works on the Wheatstone Bridge principle, which to those who have studied physics means it is an imperceptible current passed between two electrodes on the subject's skin. It has been demonstrated under certain conditions when the subject is under stress the potential of his skin, the electrical conductivity of his skin, fluctuates apparently in relation to the amount of stress. So the examiner simply watches a needle to determine or to observe these fluctuations and the amount of current going between one electrode to the other one.

The subject cannot feel this and there is no danger involved in it. It is an unreliable criterion used by itself in determining truth and deception.

Mr. INBAU. Experimentally you can get some very good results.

Mr. KASS. And in the field?

Mr. INBAU. In actual criminal cases it is by far the least helpful of all of these physiological recordings.

Mr. JOHN REID. Several years ago, Mr. Kass, we made a study of where we took 1,500 cases and evaluated the GSR responses and halfway through we believed that the instrument was working just the opposite of what we expected it to do and there were no responses on the guilty and there were responses on the innocent.

We thought maybe we had arrived at something, so for the next half we threw the whole study upside down and it did not come through in the same manner.

Mr. KASS. Mr. Backster.

Mr. BACKSTER. May I inject one point in defense of galvanic skin response. My experience has not been that of Mr. Reid when the technique structure in which it is utilized is actually groomed for the nature of the response itself. My galvanic skin response tracings have had direct correlation with the truth of deception of the target issue as related to an arousal on the GSR or the tracings have been nonproductive. But never in the opposite direction. I must say I have never experienced that. I have specialized in GSR usage for years.

Mr. INBAU. I think you would agree that you would not want to rely upon that alone.

Mr. BACKSTER. I think that we should not rely on any one indice alone but have one reenforce each of the other two. If we have all three working for us, fine. On the law of averages, one of the indices will not be producing. Should it be galvanic response at the time, or breathing, or cardio tracing, we can still use the other two tracings to arrive at a firm determination.

Mr. KASS. Where the monograph examiner has merely a galvanometer, would you rely on this alone?

Mr. BACKSTER. Is this a recording or a visual galvanometer?

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Mr. KASS. Either one.

Mr. BACKSTER. In the use of the visual, it is my opinion that he is completely out of his mind and in the recorded he is partially without sound reasoning.

Mr. KASS. I have just one further question, Mr. Chairman.

Mr. Lindberg, should the results of a polygraph test be made known to the subject?

Mr. LINDBERG. I would say that I think it is generally agreed that except in cases where the giving of that information to the subject would severely jeopardize the security of the country, which I presume there are some experts that could lay out those rules, our policy has been and by law in the State of Illinois a subject is entitled to a report or a copy of the report issued as a result of his polygraph examination and the answer would be "Yes."

Mr. KASS. Mr. Chairman, may I submit for the record at this point a copy of the Illinois State law which Mr. Lindberg referred to?

Mr. MOSS. Is there objection?

Hearing none, it will be inserted at this point in the record. (See exhibit 1A, p. 123.)

Mr. KASS. I have no further questions.

Mr. MOSS. Mr. Hardy.

Mr. HARDY. I have no questions.

Mr. MOSS. Mr. Griffin.

Mr. GRIFFIN. How many different types or makes of polygraph instruments are on the market?

Mr. JOHN REID. Fundamentally there are only two, two companies that are making the instrument. The Stoelting Co. in Chicago, and the Associated Research, which also is in Chicago. The Stoelting Co. also manufactures my instrument.

Mr. GRIFFIN. You made reference that there are two or three different responses that are measured in these two companies who produce the instruments and they measure all of these.

Mr. LINDBERG. That is correct.

Mr. JOHN REID. Yes; the instruments are very similar.

Mr. GRIFFIN. How many different schools or established schools are in existence for the training of polygraph operators?

Mr. JOHN REID. There are four that I know of. One of Mr. Backster's in New York and Mr. Arthur in New York. That is two. There is a Keeler Institute in Chicago. We have a training program and Camp Gordon has a training program for the military.

Mr. GRIFFIN. To your knowledge, is the one at Camp Gordon the only one that the Federal Government has?

Mr. LINDBERG. We understand that the Federal Bureau of Investigation has an examiner whose job it is to train other agents in a 2-week training course in the polygraph.

Mr. GRIFFIN. Now, on a somewhat unrelated matter to that line of questioning, what about the use of hypnosis as a way of fooling the lie detector? Has there been any research to see whether or not a person could be put in a state of hypnosis ahead of time and could his responses be different as a result of that?

Mr. LINDBERG. I think Professor Inbau, Mr. Reid, and I have specifically avoided getting involved in experiences involving hypnosis primarily because we don't see a benefit in diagnosing truth and decep-

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tion. I think Mr. Backster has done work in that area or at least knows something more about it than I do.

Mr. GRIFFIN. If you have anything that you want to add.

Mr. BACKSTER. I think it is untimely that we discuss that before conclusions are reached. This is too much one-sample research reported on already.

Mr. GRIFFIN. All right.

I have no further questions.

Mr. Moss. Mr. Reuss.

Mr. REUSS. Mr. Chairman. And I should warn you gentlemen that as of now I think the lie detector is largely "bunk" and I think I have to be convinced about it, having observed it for some 30 years.

You have said that the lie detector is decisive in 95 percent of the cases and that of those 95 percent of the cases it "goofs off" in only 1 percent.

Is that right?

Mr. LINDBERG. Yes.

Mr. REUSS. Would you explain the data upon which this assertion is based? This is the "nub of the coconut," it seems to me.

Mr. LINDBERG. It certainly is. The data upon which we arrive at that conclusion—and by the way, the exact conclusion is that the technique properly conducted is "capable" of 95 percent or upward of 90 percent decisiveness and an accuracy factor of 1 percent error. We are confronted with the same limitation in assessing our accuracy statistics that that judges, juries, and other tries of facts, such as arbitrators are, in determining whether or not they have been right in x number of cases or wrong in x number of cases. We base our experience on a group of samples such as a number of subjects and some in your States where, I remember specifically, where 100 persons in a bank were tested, 99 of those persons polygraph records indicated that they did not steal the amount in issue and the 100th subject tested did and subsequently a confession by him verified that fact.

Compiling these statistics we arrive at an accuracy factor of less than 1 percent error.

Mr. REUSS. That is fair enough if your tests show in the case put that one bad guy has been stealing the money and 99 percent are innocent, and that they all look the same. Ninety-nine don't show a wobble on the polygraph and the 100th wobbles all over the lot and later by extraneous evidence he is established to be the sole thief, I would concede that this is very persuasive evidence of the utility of the polygraph.

However, show me the evidence. This is what this committee has to examine into as question No. 1.

Mr. LINDBERG. Yes, but I think you would agree, Congressman, that you are confronted with the same limitation that you would be if you had to decide whether or not a neurologist or a group of neurologists were correct, also. These people are also dealing with life and death matters, so to speak.

Mr. REUSS. When we examine the neurological profession we will give them an equal course of disputes but today it is lie detectors.

Mr. LINDBERG. That is correct.

Mr. REUSS. What evidence can you give the committee of the validity of your findings that they work 99 times out of a hundred?

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Mr. INBAU. You will find a statistical presentation in the third edition of our book which Mr. Kass has involving a study of 5,000 subjects.

Mr. REUSS. I yield to Mr. Hardy.

Mr. HARDY. I appreciate that. This percentage figure that you have used was based on statistics gathered with respect to tests administered by whom?

Mr. LINDBERG. We are referring only to our statistics, which recognize the fact that there are examiners with far less impressive records, so to speak. There are many who make decisions perhaps in only half the cases. I am suggesting a capability, Congressman.

Mr. HARDY. That is what I wanted to be sure of. That is what I understand. I am not sure the record correctly reflected that. You are speaking now of tests conducted by John Reid & Associates, is that correct?

Mr. LINDBERG. That is right.

Mr. HARDY. So this would not have any bearing on the accuracy of tests conducted at random by others?

Mr. LINDBERG. That is correct.

Mr. HARDY. That is what I wanted to establish.

Mr. LINDBERG. There are no industrywide statistics, so to speak.

Mr. HARDY. I wonder if there are any militarywide statistics.

Mr. MOSS. We will have them before us.

Mr. HARDY. We will have them so we will have to try to develop that.

Mr. JOHN REID. I think it should be understood, too, as Mr. Lindberg stated, it is difficult in so many cases to establish the truthfulness or verified truthfulness or verified lying of some individual in a case. There are very few guilty subjects who, if we had made the mistake of passing them, would volunteer that we were wrong. On the other hand, if we reported an innocent person as guilty, continuing police investigation would confirm this error.

Mr. HARDY. I wonder if Mr. Backster's experience would coincide with this percentage evaluation.

Mr. BACKSTER. I will tell you my experience and then let you judge whether it coincides. Actually, to me a statistic is a rather reverent thing because it is something that you sometimes work for years to arrive at. For that reason I avoid them in almost all situations and talk only in terms of estimates. If I know that the complete validation procedure has not been utilized, you can be quite sure that some one may be waiting for you as they did in the Harvard Business Review article. Some of you have had your statistics criticized before. It is better not to give statistics but to talk in terms of what we are doing to create proper groundwork from which good statistics can be accumulated in the future rather than to attempt to justify alleged statistics of the past.

This is what I have attempted to do in trying to coordinate a standardized approach through a note pack that would be used in each examination of a specific nature. If you look in this note pack that I have placed before you you will see that the groundwork within that book, from beginning to end, is such that it lends itself very well to statistics that can be gathered by the thousands from the difference of examiners that have been schooled in this note pack usage.

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Mr. HARDY. Do I correctly interpret your statement to mean that you are not sufficiently sure of your statistics to rely on them?

Mr. BACKSTER. If I don't have statistics I don't need to rely on them. It is an estimate which I am relying on.

Mr. HARDY. You have to distinguish between estimates and statistics in this case.

Mr. BACKSTER. I very sharply distinguish between them. I am talking in terms of estimates and not statistics.

Mr. INBAU. I would like to make this statement, too, and it coincides with what Mr. Backster said, and I am quite sure Mr. Reid and Mr. Lindberg are not offering these figures as absolute. It is in the nature of an estimate. By the very nature of things it has to be. I would prefer to rely upon the statement that in competent hands this technique works with a very high degree of accuracy and let it go at that. It is a subject that is not suceptible to actual statistical analyses and reliance if you want to talk in terms of whether it is 1 or 6 percent. So to some extent I think that is true.

Mr. LINDBERG. For what it might be worth, Mr. Hardy, in the 30,000 cases conducted in our laboratory, Mr. Reid may want to correct this. I don't recall nor do we have a record of an instance where we reported a person mistakenly guilty. We feel we may well have passed people who are innocent by reason of the fact that they failed to emote. I don't know if you recall one or not. This is why we feel confident in the situation, even as we pointed out and Mr. Inbau agreed, these are not definitely ascertainable commodities, just like the situation of a judge's decision.

Mr. HARDY. Thank you.

Mr. REUSS. I would like to return to this. I take it, Mr. Lindberg, your assertion of 99-percent accuracy, which you said had been the subject of a written work, is that contained on pages 110 through 113 of the 1953 edition of "Lie Detection and Criminal Interrogation," by Mr. Inbau, and Mr. Reid.

Mr. LINDBERG. Yes; with the one exception. The clerical error regarding the .0007. It should be .007.

Mr. REUSS. The decimal point is one decimal to the right of where it should be?

Mr. LINDBERG. That is correct.

Mr. REUSS. I am referring to pages 110 to 113 in this book, and I take it the authors of the books are two of the gentlemen that are before us today.

Mr. LINDBERG. Yes.

Mr. REUSS. The reference is to some 4,280 people who were accused of committing a crime and who were examined, and as a result of your polygraph tests, 64.5 percent of the 4,280 people were reported innocent.

Mr. LINDBERG. That is correct.

Mr. REUSS. I then look down to the percentage of those reported innocent which would be roughly, let me see, out of 4,280 people——

Mr. LINDBERG. They have it here, 2,759 people.

Mr. REUSS. 2,759 people. Of those 2,759 people who were reported innocent I gather only 323, or just a little more than 10 percent, were actually verified as really having been innocent.

Mr. LINDBERG. That is correct, by someone else's confession.

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Mr. REUSS. That is by no means a foolproof verification, is it?

Mr. LINDBERG. What better method is there, Congressman? I am just suggesting that if you have a better lie detector to suggest where we could verify these—it is a very difficult process.

Mr. REUSS. I don't have a better lie detector to suggest. What I am suggesting is that a lie detector to me belongs in the same common-sense category as does the guy who looks like a liar. Does he wring his hands? Does he sweat? Does he pant? Does he palpitate? And so on. This is a somewhat more scientific way of applying the common-sense wisdom of the ages. I want to make this my initial inquiry because then when we go on to what do people do with lie detector tests, I am going to have some very searching questions to ask.

Mr. LINDBERG. I am going to suggest that there is a definite limitation in the amount of information that we can obtain along the lines that you require.

Mr. BACKSTER. Congressman, do you hope to do that during the brief hearing today, to bring yourself to that level?

Mr. REUSS. The answer is "No," but I have to do the best I can and I did want to examine into the assertion that a lie detector has been proved to be on target in 99 percent of the cases. It turns out on cross-examination that in about 90 percent of the cases where the lie detector reported a suspect as innocent, we have no real evidence as to whether he was in fact innocent or guilty.

Mr. BACKSTER. One thing I have never done, and that is to allow myself to be asphyxiated with statistics. I stated the basic thing which you said was a gimmick or nonsense. I would like to clear that up for you in any way possible before we take up the statistical coverage.

Mr. REUSS. Clear me up.

Mr. BACKSTER. The statistics could be misleading.

Mr. MOSS. I wonder if the gentleman would yield at this point.

The House is now in session and because of the complications of this new building, I think it might be advisable to adjourn the hearings until 10 o'clock tomorrow morning, at which time the member may resume his interrogation and other members will have time to fully develop their line of questioning.

Mr. BACKSTER. Would that be the panel again, or another program?

Mr. LINDBERG. The same witnesses?

Mr. MOSS. The same witnesses.

Mr. BACKSTER. All right, sir.

(Whereupon, at 12:07 p.m., the subcommittee was recessed, to be reconvened at 10 a.m., April 8, 1964.)

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USE OF POLYGRAPHS AS "LIE DETECTORS" BY THE FEDERAL GOVERNMENT

(Part 1—Panel Discussion With Private Polygraph Practitioners)

WEDNESDAY, APRIL 8, 1964

HOUSE OF REPRESENTATIVES,
FOREIGN OPERATIONS AND
GOVERNMENT INFORMATION SUBCOMMITTEE
OF THE COMMITTEE ON GOVERNMENT OPERATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., pursuant to recess, in room B 300, Rayburn Office Building, Hon. John E. Moss (chairman of th subcommittee) presiding.

Present: Representatives John E. Moss, Henry S. Reuss, John S. Monagan, George Meader, and Ogden R. Reid.

Staff members present: Samuel J. Archibald, staff administrator; Jock Mattison, chief investigator; and Benny L. Kass, subcommittee counsel.

Mr. REUSS (presiding). Good morning. The Government Operations Committee will be in order. Let the record show the presence of myself and the gentleman from New York, Mr. Reid.

The chairman is delayed for a few moments and will be here shortly and has asked me to resume the discussion.

I have a number of questions to ask of you gentlemen. I want to pursue the point I was pursuing yesterday about the accuracy of lie detector tests and particularly starting with the point made by Mr. Lindberg, I think, that at least as to lie detector tests conducted by John E. Reid & Associates, the margin of possible error was only 1 percent of the total of tests given.

TESTIMONY OF FRED E. INBAU, NORTHWESTERN UNIVERSITY SCHOOL OF LAW; ACCOMPANIED BY CLEVE BACKSTER, BACKSTER SCHOOL OF LIE DETECTION, NEW YORK, N.Y.; JOHN E. REID, JOHN E. REID & ASSOCIATES, CHICAGO, ILL.; AND GEORGE LINDBERG, JOHN E. REID & ASSOCIATES, CHICAGO, ILL.

Mr. LINDBERG. That is correct. The estimated?

Mr. REUSS. Yes. I was referring to the volume, "Lie Detection and Criminal Interrogation," published in 1953, and asked you whether the following is not the fact: that of those who were reported guilty by the polygraph test, consisting of 1,334 people out of a total of 4,280 people who took the test, whether it is not a fact that only 791,

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or 59.2 percent of those who were reported guilty were interrogated with the aim of obtaining a confession.

Mr. LINDBERG. That is correct.

Mr. REUSS. Of those who were interrogated, only 486 or 61.4 percent of those interrogated actually did confess.

Mr. LINDBERG. That is correct.

Mr. REUSS. Therefore, if you take those percentages of a percentage, is it not a fact that only 36 percent of those who were reported guilty by the polygraph, were, in fact, found to be guilty?

Mr. LINDBERG. As verified by a confession.

Mr. REUSS. Or by any other method.

Mr. LINDBERG. Only by confession based on these statistics.

Mr. REUSS. I know, but over and beyond the 36 percent who were found to be guilty by a confession, were there no others who were found to be guilty by other methods, such as a trial and conviction?

Mr. LINDBERG. We would never count that in a statistic. A conviction means nothing to us.

Mr. REUSS. Then on the innocent side, of the 2,759 people who took the test and were reported innocent, only 11.7 percent of those who were reported innocent were verified innocent by another confession.

Mr. LINDBERG. That is correct.

Mr. REUSS. So if you combine the two percentages, it is a fact, is it not, that only 18.9 percent of the total who took the polygraph test were, in fact, verified as either innocent or guilty?

Mr. LINDBERG. Presuming your mathematics is correct, I will accede to that. I don't know if they went into that point.

Mr. INBAU. No, those are his figures.

Mr. REUSS. My mathematics is based upon the combination of the two percentages and your answer is taken subject to your reservation on my mathematics. I would want that very clear.

Mr. LINDBERG. Yes. What figure did you give, Congressman Reuss?

Mr. REUSS. 18.9 percent of the total of innocent and guilty together were verified as correct.

Mr. LINDBERG. Were confirmed, yes.

Mr. REUSS. That 18.9 percent verified correct is a far cry from 99 percent accuracy, is it not?

Mr. LINDBERG. Congressman, our statement on that is that we estimate, based on, let us say, your figure of 18.9-percent verification, that we have less than 1-percent error, because in that 18.9 percent verified we were in error less than 1 percent.

So in arriving at our estimate we are extrapolating from the fact that we were less than 1-percent error in the 18.9 percent of the cases where the results were definitely verified and corroborated. So it is a matter of extrapolation.

Mr. REUSS. I do understand correctly that actual proof of the accuracy of the polygraph test was only obtained in 18.9 percent, assuming my mathematics is correct.

Mr. LINDBERG. Yes.

Mr. REUSS. Let me ask this question of any member of the panel, incidentally. Cannot symptoms other than guilt produce swiggles and wiggles on the polygraph, such as surprise, shame, embarrassment, or any one of a number of human emotions that don't bear on guilt?

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Mr. JOHN REID. Yes, sir, but if the examiner is not qualified to eliminate these and identify them as either guilty reactions or anger or embarrassment or some other type of emotional upset, then he is not much of an examiner.

We do have a guilt complex test that we administer when we get reactions in the test that indicate some type of emotional upset. If these are strictly based on some other emotion rather than fear of being detected, then we should be able and we can identify these emotions and this type of person as either guilty or innocent.

Mr. LINDBERG. I might paraphrase, in a properly conducted polygraph examination there are at least four runs of the graph, so to speak, therefore the random phenomenon that you are suggesting would have to occur at exactly the same place on four examinations.

In other words, the reason why we run several tests which constitute one whole examination is to eliminate the probability that a random emotional disturbance on a polygraph record, which there are in any examination, will not occur at the same point throughout four tests. A conclusive determination of deception requires consistency of reaction on the relevant issue in each of those tests.

Mr. INBAU. I might add to that, if I may, Mr. Reuss, there is, as we pointed out yesterday, a pretest interview of the subject so you eliminate much of this at that level. On the matter of shame, you avoid questions that have no relevance to the matter under investigation, such as the personal embarrassing question that I referred to yesterday. So you minimize the risk of these things before the test is even begun.

I think we should bear in mind that this test is not a 10- or 15-minute deal. In many of these instances the examination of the one individual consumes as much as an hour's time. So it is not a snap judgment somebody is making from a wiggle in the graph.

Mr. LINDBERG. And all questions are prepared in advance with the subject. He has been completely rehearsed in the issues that will be covered on the test. So the element of surprise is eliminated.

Mr. JOHN REID. To further state that, Mr. Reuss, there are a number of occasions, say up to 10 percent of the time, that we have to have the man return for further examinations at a later date. We call these reexaminations, because we cannot establish the status of the subject at the time we had him at the first sitting.

Mr. BACKSTER. May I add to that, sir, before we go on?

Mr. REUSS. Yes.

Mr. BACKSTER. This particular phenomenon that you mentioned, of extraneous reactions, may I first clarify if that is by observation of the charts, or observation of the individual? Everything that you are now talking about would be on the chart, something that is recorded on the chart for study after the examination is completed? Is that the understanding?

Mr. REUSS. Yes. For example, and without restricting the generality of what I have said, you might be examining somebody about a bank defalcation of which the person may not have been guilty, but he may have been guilty of some peccadillo unconnected with this which would make him feel guilty. This is the problem I am exploring. The panel's answers have been responsive on this point.

Mr. BACKSTER. I would like to respond further on that, if I might. If the incident you might be thinking of involves the false positives

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and false negatives that have been widely covered by the press, as I recall upon seeing the questions that were asked at that time, the fault would lie within the polygraph examiner at the point of question formulation rather than any other later portion of the overall procedure. We have five distinct and separate phases in a polygraph examination, the first one which involves getting case information and not always the case facts.

Case information that will broaden us in the scope of the investigation concerning that particular point where we are knowledgeable and can further approach the solution. After getting that which we feel is adequate case information we must then select the most stigmatic target, the thing that is most at stake for the person taking the examination.

If it happens to be a multiple target situation, such as a rape, murder, robbery, we would have to decide which of the three we wanted to pursue and stick to only one of these during the examination. This selection is done not, in a random fashion, but actually by evaluation of each of the possible targets numerically. In setting up the scoring system—the target which has the highest score would be pursued first.

As the second step, the selection of the target, is completed, we then go into question formulation. Here the questions must be questions that allow no room for rationalization or confusion on the part of the subject. This is the very early area, in fact the second step of the five, where, in that particular incident of the bank defalcation, I think a grave error was made.

The question involved something similar to this, and I am stating this from memory, so I can't guarantee its accuracy. Have you ever stolen money from the bank or a bank's customers? As it turned out, this individual had a mother that had a bank account there and I believe either a sister or brother who had a bank account in that bank. If anyone absconded with money, or there was just a mild irregularity, even at home, the person would have shown on the questions asked because they were so broad. Because the person would have stolen from a bank customer, but at home, instead of at the bank.

In the bank example this would charge itself off as examiner error right at that point without going further. But then the next overall step, after our question formulation, is that of embracing these questions in the proper technique structure which is also important. This involves running the actual test itself, then of evaluating the charts that are produced by that test. If anyone of the links in this chain is broken or is weak, the old saying the chain is no stronger than its weakest link, is certainly true here. Actually in a rather methodical pursuit of this matter which has been of grave concern to me in the last 4 years, I have tried to set up a form that would lead the examiner, in a systematic sense, through these procedures; all five of them. He would then be accountable for each of the steps as he went along, and accountable for each portion of the step.

If he did become slipshod or he did become inadequate in any one of these steps, we could tell exactly where it happened when later inspecting the note pack that he was using. When you come to the interpretation of the charts, this involves not just one asking of a question, as Professor Inbau and Mr. Reid have said, it involves a number of askings of the question.

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In this particular system we require at least 12 separate chart evaluations regarding the issue at stake. In other words, two evaluations per tracing. Each of the three tracings is handled as a separate and distinct evaluation having no relationship to the other two tracings when a strong relevant question is asked.

The issue is covered twice during each chart, giving six completely independent comparisons. When we run two charts, it makes 12, and three charts 18, separate intercomparisons to see if the person is being truthful or not. Anything that happens in an accidental sense, in 1, or 2, or 3 of these 18 times, is insignificant because it cancels itself out.

Mr. REUSS. Thank you very much. I have just one more question.

In the 4,280 cases which were the subject of these percentages that we were discussing recently, those I gather, were all people suspected of criminal offenses.

Mr. LINDBERG. Yes. These were specific issue cases as opposed to screening cases.

Mr. REUSS. It is a fact, is it not, that in addition to being used as a method of criminal detection in criminal matters, polygraph tests are widely used in industry and Government as a method of determining whether a proposed employee ought to be hired or not?

Mr. LINDBERG. As one of the testing devices; yes.

Mr. REUSS. Is it not a fact that both in industry and Government there are frequent cases where seekers after employment are not hired because of the results of the polygraph test?

Mr. LINDBERG. Congressman, I wouldn't be able to comment on whether it was the polygraph test which was the sole basis of their rejection. Frequently it is combined with other evidence and results in a decision not to hire.

Mr. REUSS. Whether alone or in combination with other tests, the polygraph is frequently relied on in industry and in Government as a means of refusing employment to a prospective applicant; is it not?

Mr. LINDBERG. I would say that is true.

Mr. INBAU. May I add something to that?

Mr. REUSS. Yes, please.

Mr. INBAU. I would like to give an example of how this works so you know the basis upon which an applicant for employment may be rejected. In the vast majority of instances it is not just the examiner's opinion but the disclosure on the test that the employee, let us say if he is applying for a position of trust, had stolen previously. So you have that to go on as well. I would like to give you a good example in Mr. Reid's experience.

Mr. REUSS. I think we could put to one side cases where, by cross-examination, by a polygraph test or by extraneous evidence, the prospective employer, industrially or governmental, does establish that the man who wants the job is a criminal. Let us put that to one side.

Mr. INBAU. But can you, Congressman, for this reason——

Mr. REUSS. There is a clear example——

Mr. INBAU. I wonder if you can put that aside.

Mr. REUSS (continuing). That the applicant would not want to go through.

Mr. INBAU. When you are evaluating the technique. I don't think you can put that aside on fairness that it should be put aside because

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except for the polygraph examination this would not have been disclosed.

Mr. REUSS. I didn't mean to put it to one side and say it is valueless. I meant to put it to one side because I would completely agree with you that in a case where a prospective bank teller is found to have a record of larceny, whether that record is disclosed by a polygraph, by looking at the police records, by confession, by somebody else, verifying, or in any other way, in such a case the bank does not want to hire the prospective teller.

However, is it not a fact that in considerable numbers of cases in industry and Government, though criminality in a specific case is not established, either by breaking down under the polygraph test or by confessing or by the evidence of third parties, is it not a fact that a negative result in a polygraph test deprives the man of his opportunity to get that particular job?

Mr. JOHN REID. It is not based on the negative results alone. There is a margin of error that you speak of, and we speak of, and if there is any doubt we lean toward the innocent and assist the person to have that job.

Mr. REUSS. Are you saying that in no case you have ever heard of has a person been refused a job because he flunked his polygraph test?

Mr. LINDBERG. That is true.

Mr. REUSS. Leaving aside cases where criminality is established.

Mr. LINDBERG. Certainly there are cases where that happens.

Mr. INBAU. Mr. Reuss, I think you gentlemen ought to be made aware of this practice, too. The mere fact that an individual applying for a position has admitted having stolen money from others or previous employers doesn't mean he is automatically rejected either.

As a matter of fact, I know this used to be my practice and I am sure it is the practice of Mr. Reid and Mr. Backster and other people that are established in this type of work, that many times you will recommend a fellow like that for the position.

Mr. REUSS. It depends on the position.

Mr. INBAU. There is some therapeutic effect in having disclosed this and going on a job and starting out clean. So it doesn't mean every time a fellow admits having done something wrong that he is automatically rejected. I think that factor ought to be borne in mind in evaluating the application of this entire technique.

Mr. LINDBERG. Frequently a field investigation of an individual will bring up certain factors by neighbors and other people who have a grievance against this individual on a personal basis and say, "Look, I have heard that this fellow has been stealing and stripping cars for years."

This issue is brought up as part of the information brought to the polygraph examiner and the examiner is able to verify the fact that the subject is not guilty of this hearsay. I think that is important also. To answer your questions, there are instances where a subject will be refused employment in industry solely on the basis of the fact that he failed to pass a significant question on the polygraph test.

Mr. REUSS. You say in industry, but what about Government?

Mr. LINDBERG. I can't speak for Government.

Mr. BACKSTER. I would like to comment on that, sir, if I might.

Mr. REUSS. Yes.

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Mr. BACKSTER. I can only speak or be responsible for my own evaluations in regard to which employer, or which Government agency, has rejected a person based on indications of the polygraph alone. In my own experience, the system that I have tried to use or caused to be used consistently does not allow for rejecting a person based on polygraph examination results alone.

The main influence that the polygraph examination might have is in bringing forth statements by the applicant himself. These statements are that which is cause for rejection of the applicant by the employer or the Government agency. In fact, in the method of formulation explanation on every single report that I have mailed out in over 16 years during which I have been doing this full time, the evaluation is based on the job applicant's results on a written risk factor examination, and oral risk factor examination, electronic risk factor investigation and evaluation of current attitudes.

All information in this report except as otherwise stated is as stated by the job applicant. In other words, it is his own statements concerning each of these things in the procedure that is cause for rejection by the polygraph, if that is the reason he is rejected.

In most cases there are three or four other separate factors. His road test, if he is going to drive on the job. His battery of psychological tests, if that is the case, his personal interview, the medical examination, all of which are coordinated as to whether the man will be acceptable or not.

I personally do not make recommendations other than to establish what degree of risk exists in the overall areas concerning the man's employment and then leave it up to the agency concerned, or the employer concerned, to take it from there. That is done by a risk factor estimate.

Mr. REUSS. By the ageny concerned, you mean the governmental agency?

Mr. BACKSTER. It could be that; yes.

Mr. JOHN REID. Mr. Reuss, may I comment here. There should be some knowledge as far as the committee is concerned regarding the difference between a screening test and the type that we speak of and we base our statistics on. A screening test is one in which we are using a very broad question, "Did you ever steal anything from a former employer," such as that, as against the criminal test where we ask, "Did you shoot John Doe at Sixth and Main Streets last night," very direct and there is clear cut reaction.

With the employee, the applicant for the job, why we guard ourselves so closely in making an analysis of his reactions regarding these responses is because it could cover so many things, and after the first group of tests we would question him regarding these reactions, at that point his explanation may be regarding something very minor, and further testing would indicate that this relieved the tension of the question and we could dismiss him as a result of that.

Some of them may make quite strong and big admissions regarding things and the reactions are still on the test after the first test is completed, so further testing is necessary. This might be important to show the line of distinction between the specific type test in a criminal case as against the screening test in industry and most likely in Government.

Mr. BACKSTER. May I make one comment on that?

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Mr. REUSS. Yes.

Mr. BACKSTER. I am glad Mr. Reid brought up this distinction because the distinction is so important, where we will be going from question to question, one of your questions which may be concerning screening and the other, which may concern a specific incident. We have two broadly different types of tests that are used.

One we call a probing peak of tension test, which is actually what a preemployment examination amounts to where we have numerous background areas, and where the person may show chart reactions only on the area that is most bothersome to him. In fact that area, by our basic psychological principle, that of psychological "set," would cause him to draw to that area to the exclusion of others where he may also be attempting some deception.

In the other type of examination, the specific case, we do not have that situation at all. It is very, very different where we ask the man the direct question, did you commit so and so act, his answer then being evaluated in terms of truth and deception. There is no other factor to detract from that, except one that is deliberately put in. The Reid control procedure was the first usage of that, where if he is not wrong on the issue itself—the crime let us say—then he will be concerned with that which has been injected to detract from the relevant question's natural stigma which may have shown up if the control procedure had not been there.

Mr. INBAU. May I just make a very brief statement here?

Mr. REUSS. Mr. Inbau.

Mr. INBAU. What I am trying to do is put this whole problem in its proper perspective. So frequently the notion is that you take an innocent person out of high school and give him a polygraph test and for reasons of his admissions or other reasons he is rejected for employment.

This test is now being used in the Chicago area, not only in industry but in the testing of applicants for positions on police forces. If you talk about the protection of the individual, here is one area where this technique is rendering a real service.

Mr. Reid's experience in the testing of applicants for positions on police forces in the Chicago area, in the suburban police departments, Evanston and some others, have come up with some frightening disclosures as to the extent of thievery, narcotic addiction, and what not of people applying for positions on police forces. Their rejection rate, Mr. Lindberg and Mr. Reid can give that, is quite high.

So I think this technique is rendering a service not just on one side, but I suggest to you by reason of this development that it is producing something in the interest of the individual. You talk about the individual's rights and liberties and securities, if you get on the police force, somebody who is a burglar himself, who is a narcotic addict, and guilty of other things, with a record like that back of him, he is the type of policeman who is going to be abusing civil liberties and civil rights.

I suggest to you that we ought to keep this in mind, too, when we decide whether this is a good thing or a bad thing.

Mr. REUSS. Thank you.

Before calling on Mr. Meader I would like to apologize to the guests here in the room because of the fact that I notice many are mopping their brows. Our air-conditioning system is not working very well. I

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would remind members that we operated on a very limited budget in setting up this building. We will try to improve it.

Mr. Meader.

Mr. MEADER. Thank you, Mr. Chairman. Mr. Reid, as I recall the testimony yesterday, there were no reliable statistics of cases where the polygraph has been used.

Mr. JOHN REID. By reliable statistics——

Mr. MEADER. You had statistics for your own use. I am talking about a nationwide basis.

Mr. JOHN REID. No, not on a nationwide basis.

Mr. MEADER. The polygraph is widely used by State police, city police, FBI and so on. Are they not required to report the incidents where that is—aren't those statistics accumulated anywhere in the FBI or anywhere else?

Mr. JOHN REID. As far as I know, the statistics are not accumulated. I think this is a failure on the part of these different agencies and State groups, and they should.

Mr. MEADER. Are you required to report to any other agency, State or National, the results of your use of the polygraph?

Mr. JOHN REID. No, sir, we are not. We are held under a licensing law in Illinois but we are not required to report any statistics any place.

Mr. MEADER. Is there any informal trade association or other association that makes it its business to accumulate statistics on the use of the polygraph?

Mr. JOHN REID. No, sir; I think we are kind of a bastard child, sir, and I think it is important that we do have the committee to hear how poorly we have come from nothing and we have been in amateur hands in all these years. I think it is time that some professional group or Government gave us some assistance in this field.

Mr. MEADER. Do I understand there is no trade association of polygraph operators or polygraph manufacturers?

Mr. JOHN REID. We have three different associations but I think all of us operate independently of each other and it is not really a trade association but an interchange of ideas between ourselves and that is about all.

Mr. MEADER. What are those associations called?

Mr. JOHN REID. The American Academy of Polygraph Examiners, the one that Professor Inbau and myself started. Then the Academy for Scientific Interrogation, the largest one of the group. The third one is the National Board of Polygraph Examiners.

Mr. LINDBERG. There is a fourth one, I believe, called the International Association.

Mr. BACKSTER. Yes, International Association of Polygraph Examiners, which is the second largest in membership.

Mr. MEADER. Could you give me some idea of the size of those organizations with respect to membership?

Mr. LINDBERG. I think the American Academy of Polygraph Examiners has 50 members. We have a spokesman from the ASI here. He may want to tell you what his membership is.

Mr. Moran, do you know?

Mr. MORAN. (An individual later identified as Kenneth W. Moran of the Council of Polygraph Examiners, 437 Merchandise Mart, Chi-

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cago, Ill.) I would estimate about 300 in the American Academy for Scientific Interrogation.

Mr. BACKSTER. May I correct that? It is nearly 400. I have the last count on that. (See exhibit 9, p. 188.)

Mr. LINDBERG. I think there are 20 members in the National Board of Polygraph Examiners and I have no idea how many the International Association has.

Mr. LINDBERG. There are many people who hold mutual memberships in each of the organizations.

Mr. MEADER. Let me ask you about the Illinois law. Is there any requirement in the Illinois law for the licensing of examiners?

Mr. LINDBERG. The purpose of the Illinois law was to license polygraph examiners and regulate them as to formal education, training, and competency. We require a college degree, 6 months' internship training, and a rigorous written test and practical test as to competency. Those are the three requirements of the Illinois law.

Mr. MEADER. There is no requirement of a law degree?

Mr. LINDBERG. No; college degree. It was hard enough getting that, Congressman.

Mr. MEADER. No specification of any courses that would be taken in college, psychology or anything else?

Mr. LINDBERG. No, we avoided that because we felt that all colleges give the same basic liberal education during the first 2 years. We felt that was a sufficient base upon which we could build specific or teach specific subjects such as physiology and psychology.

Mr. MEADER. Let me ask you gentlemen whether it is an advantage to an examiner to have had not only a law degree but some practical experience in trial work?

Mr. LINDBERG. Not particularly.

Mr. INBAU. I would like to believe that, having had it myself, but I don't think this is something that really ought to be imposed as a basic qualification.

Mr. MEADER. I didn't ask that question, Doctor. My question is, whether a trial lawyer, for example, would be a better examiner than one that never had any legal experience at all.

Mr. John REID. I believe not.

Mr. MEADER. Are you a lawyer?

Mr. JOHN REID. I am, sir. I say in this type of business we are not in the game or not in the position of cross examining subjects. We ask our questions directly in the examination tests and when we get around to the point of interrogating the subject for confession purposes it is more of a psychological approach that we use rather than a cross examinational type. I think, sir, if I might say, that as far as the qualifications are concerned I would rather have a man come right out of college and come to me for training rather than have any particular background in any of these disciplines.

Mr. MEADER. May I ask all of you gentlemen at one time, and I mean you to answer the question seriatim, do any of you know of instances where a polygraph examination showed the subject to be lying where he subsequently confessed, but then later on there was absolute proof of innocence?

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Mr. INBAU. I know of no such cases that where as a result of the polygraph examination he confessed and it was later disclosed that he was innocent. I know of no such cases.

Mr. BACKSTER. I know of no such cases including the Anderson case in the Saturday Evening Post.

Mr. MEADER. How about you?

Mr. JOHN REID. No, sir, I do not.

Mr. LINDBERG. The only one that comes close to that was the one reported in the 1963 journal—American Journal of Psychiatry, referring to a bank teller.

Mr. MEADER. Are you referring to the article by H. B. Dearman, M.D., and B. M. Smith, Ph. D., "Unconscious Motivation on the Polygraph Test"?

Mr. LINDBERG. Yes.

Mr. MEADER. Appearing in the American Journal of Psychiatry, volume 119, No. 11, May 1963?

Mr. LINDBERG. Yes. I have no independent knowledge of that particular case.

Mr. MEADER. Mr. Reid, weren't you aware of this article?

Mr. JOHN REID. I heard of the article but I didn't recall it at this particular time.

Mr. LINDBERG. His innocence is not confirmed.

Mr. MEADER. Have you read the article?

Mr. JOHN REID. I read parts of the article.

Mr. MEADER. How about you, Mr. Inbau?

Mr. INBAU. I have not read this.

Mr. MEADER. Are you not familiar with this?

Mr. INBAU. I am familiar with it but I have not read it.

Mr. BACKSTER. I am familiar with it.

Mr. MEADER. You have not read it?

Mr. BACKSTER. I have read it.

Mr. MEADER. You don't regard that as an example where a polygraph test showed the subject to be lying and he confessed to embezzlement of a thousand dollars and subsequently it was shown that he did not embezzle any such sum.

Mr. BACKSTER. I would like to know the system they used to verify the fact that he didn't embezzle a thousand dollars other than an audit that didn't show any money missing at the time.

Mr. LINDBERG. Congressman, I might point out that frequently it occurs that there are confessions of embezzlement from funds that are very difficult to audit. I think if you were to consult the auditors they would tell you it is possible to steal money fairly easily from a bank which will not show up in an audit.

Therefore, the alleged confirming evidence in that case, namely, an audit disclosing that there was no loss, is no proof whatsoever that the man is not actually guilty of the embezzlement. In Mr. Reuss' state, for example, I got a confession from a man, verified, that he had stolen $22,500. Yet they were only able to establish $816 stolen.

The banker readily acknowledged that he had stolen the money as he said from the exchange funds and these are not auditable in many banks. So the fact that the bank records failed to disclose a loss is not conclusive proof that an error was made. As I understand, there were five different polygraph examiners involved in that case, each one arriving at the same conclusion.

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Mr. MEADER. You mean in the Dearman case?

Mr. LINDBERG. Yes, according to what Dr. Dearman says in that article. I believe it adds up to five independent polygraph examinations.

Mr. MEADER. Mr. Chairman, as long as we referred to this article, I would like to suggest that it be incorporated in the record at this point.

Mr. Moss. If there is no objection, the article will be incorporated in the record at this point. (See exhibit 2A, p. 135.)

Mr. MEADER. Let us pass to the second question. Are any of you aware of instances where a polygraph examination showed the subject innocent, but he was subsequently proved guilty?

Mr. LINDBERG. Yes, I had one of them.

Mr. INBAU. Yes.

Mr. JOHN REID. Yes.

Mr. INBAU. We can answer that all together.

Mr. LINDBERG. I think every examiner has been embarrassed by such a finding.

Mr. JOHN REID. That is where our margin of error is as far as we know.

Mr. MEADER. Let us return to the Dearman article, just a moment. Dr. Dearman is a psychiatrist and this bank employee was subsequently examined by him as a psychiatrist. The question that was asked on which the examiner concluded that he was lying and guilty was this one: "Have you ever stolen any money from the bank or its customers?"

Then the doctor goes on to show from his psychiatric examination that the patient, first, had a strongly ambivalent feeling toward his mother. She had divorced his father and 7 years later married a man with whom he did not get along with. He felt neglected and so on.

Second, the patient's wife was 2 years his senior. She had been previously married and was similar to his mother in many respects. He had been involved in financial affairs with both his wife and his mother, one to the extent of approximately $800 and another incident $1,100, one of which was related to wrecking his mother's car.

The psychiatrist emphasized the bank's customers and both the mother and wife were the bank's customers and he explained that he had this guilt feeling because of the customers and not the bank.

Was the question properly framed?

Mr. INBAU. I think that has been referred to before. The question was not properly phrased. I think we ought to acknowledge the fact that these things can happen. As a matter of fact, that is all implicit in what some of us were referring to as questions. If you get someone who doesn't know how to utilize the technique he can make this kind of mistake. If you get an examiner who will browbeat everybody who takes the test hoping he will get a confession from the guilty ones and be able to report these people are lying, these things can happen.

We will acknowledge it. The point is, though, you minimize this kind of a risk very well when you insist upon a different kind of examiner than may have been involved in this case. With respect to psychiatrists in this area, while I have the highest respect for what they are contributing in making or in helping people with their personal problems, what I would like to see the psychiatrist do instead of

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speculating and picking out an isolated case, is to go out in the field and find out what is actually occurring and that is what they will not do.

They will sit in the armchair and theorize about it and pick out a case like this and make a mountain out of it, but they don't go out in the field and find out how the instrument is working to the advantage of the public and the individual himself.

Mr. MEADER. Some might be lying on their couches.

Mr. INBAU. That is right.

Mr. JOHN REID. As far as the question is concerned, we in our book advise that the question should be directed to the subject in a direct unambiguous manner. We should not have an "and" or "or" in the question because the subject may be guilty of one and not the other.

It is a double meaning question in the first place. If the examiner was asking the question properly it should have been: did you steal any money from the bank? Did you steal any money from the bank's customers? That is two different questions.

Mr. MEADER. Let me get back to this matter of the size of this industry again. Outside of the State of Illinois, are there any States, or are there any Federal agencies or any other agencies which require some form of licensing of polygraph examiners?

Mr. LINDBERG. The State of Kentucky has a bill which we feel is generally inadequate. (See exhibit 1B, p. 128.)

Mr. MEADER. A bill or a law?

Mr. LINDBERG. A law, requiring a high school diploma and a 6 weeks' course. We feel this is inadequate. Speaking for Professor Inbau, Mr. Reid, and myself. Other agencies in the Government have regulations regarding the screening of their own polygraph examiners before they are employed as such. I am not familiar with them.

Mr. JOHN REID. New Mexico also has a law that is similar to Kentucky's.

Mr. MOSS. At this point in the record a reference will be made to the summary of Federal requirements for operators which are contained in a committee print prepared by the staff. Will you find that page so Mr. Meader may have it.

Mr. INBAU. It is facing page 14 of the committee print.

Mr. MEADER. May I inquire, perhaps it is in the committee print also, what is the total number of polygraph examiners in the country.

Mr. LINDBERG. The figure we were discussing this morning, it is difficult to say, but we estimate, aside from Federal employees, that there could be in the area of a thousand to 1,500 people who purport to operate polygraph or conduct lie detector examinations.

Mr. MEADER. How many are licensed in the State of Illinois?

Mr. LINDBERG. The licensing procedure has just begun. It is only 2 months old. Therefore no official licenses have been issued, although about 30 have been approved.

Mr. INBAU. There was a grandfather clause in that legislation so that those who were in already will be blanketed in.

Mr. MEADER. How many are they, do you know?

Mr. LINDBERG. We feel that there could be between 50 and 100 who will be accepted under the grandfather clause.

Mr. MEADER. I don't want to monopolize the time, Mr. Chairman.

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Mr. BACKSTER. May I add one point to follow your line of questioning?

Mr. MEADER. Yes.

Mr. BACKSTER. This is a question of licensing and also the question of grandfather clauses that came up. It is of little concern to me, in fact a little depressing to think that I must go through my natural life putting up with the shenanigans of the people who become licensed under the grandfather's clause. This is enough, by their sideline effects alone to eliminate the science in many other ways other than one of just basically licensing or no licensing.

I would like to emphasize at this point that I think it is extremely important that we have regulation by law as well as licensing by law. Even though a man is qualified, and does qualify by virtue of a license, this does not mean that he is going to perform in the prescribed manner, even though he could, if he wished to.

The important half of the two considerations, in my estimation, is the performance of the man or regulatory legislation that will make it illegal for him to do many of the things that he chooses to do now.

Mr. LINDBERG. I think, Mr. Backster, that is implicit in the Illinois bill. There are rules of misconduct specifically stated in the bill. Although I will admit they are rather broad I think it is regulatory.

Mr. BACKSTER. The reason I am mentioning this is that all of the difficulty mentioned concerns licensing legislation. I think it should be licensing and regulatory legislation, so that we don't get a one-sided aspect.

Mr. INBAU. This grandfather clause was not our idea in this bill. Without it the bill would not have passed and we thought this was to be preferred over no long-range licensing plan at all.

Mr. MEADER. The chairman received, I guess this morning, a letter from Dr. Dearman in which he attached copies of this article we have referred to, dated April 5, 1964. I think the letter should be in the record, too.

Mr. MOSS. I agree. If there is no objection the letter will be included in the record immediately following the article which has been already furnished for the record.

Mr. BACKSTER. Is that a lengthy letter? May we hear it?

Mr. MEADER. I will read it if you want me to, because I want to base a question on one paragraph anyway.

Mr. BACKSTER. All right, sir.

Mr. MEADER. The Honorable John E. Moss, Democrat, of California, House of Representatives, Washington, D.C. On the letterhead of H. B. Dearman, M.D., Psychiatry, 208 East Watauga Avenue, Johnson City, Tenn.

DEAR MR. MOSS: Today I read an article in our local paper, the Johnson City Press-Chronicle, in which I learned of the Government's use of the polygraph and of your committee which will begin public hearings on the use of the polygraph on Tuesday of this week.

I am writing to you for two reasons. First to send you several copies of an article written by me and Dr. Burke Smith of the University of Virginia, having to do with the polygraph, which appeared in the May 1963 issue of the American Journal of Psychiatry and second, to express to you my views on the unconstitutionality of the use of the polygraph whether in industry or criminal work.

In my opinion the use of the polygraph violates the fourth amendment as regards search and seizure. I am also of the opinion that its use violates the fifth amendment. I am aware that proponents of the use of the polygraph fall

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back on the statement that no one is forced to take a polygraph test and use this as a means of satisfying the constitutional requirements. However, this is of little or no avail because the examinee does not realize that not only will his conscious thoughts and his autonomic responses to them be recorded but his unconscious thoughts will also be delved into and consequently he will give autonomic responses to unconscious thoughts or to put it another way, he will be giving autonomic responses to thoughts of which he is totally unaware. This is never explained to the examinee and I doubt if the examiner himself is aware that this is taking place.

It is my opinion that the polygraph is used mainly as a mental blackjack to obtain a confession. In one of the bulletins put out by a concern that sells polygraph instruments and also gives a course in its use, it is stated, "that a confession is the only real check."

This same bulletin states, "the polygraph is a scientific instrument, through proper use the properly trained, skilled examiner can diagnose truth or deception just as the skilled roentgenologist or internist can diagnose hairline fractures or aortic regurgitation."

This they claim can be done by a man with only 6 weeks training and 6 months experience in the use of the polygraph. The training of the roentgenologist and internist requires about 8 years. The polygraph recording is a recording of the blood pressure, pulse respiration, and sweating of the skin and its interpretation is certainly as difficult if not more so than the interpretation of an electrocardiogram. At least with the cardiogram we are dealing with the presence or absence of physical changes in an organ by the recording of autonomic and electrical impulses. However, with the polygraph, we are dealing with the highly abstract concepts of truth and deception. I do not believe that 7½ months of training can equip anyone to deal with such concepts.

I trust that the reprints may be of some value to you and your committee.

With kindest personal regards, I remain,

Very truly yours,

H. B. DEARMAN, M.D.

Mr. INBAU. Mr. Chairman, may I make a comment on that?

Mr. MEADER. That is why I read the letter. I want you to comment particularly on the constitutional aspects.

Mr. INBAU. This is from a psychiatrist, I understand.

Mr. MEADER. That is right.

Mr. INBAU. By what right does a psychiatrist have the right to express himself as to constitutionality of anything. I have been a law teacher since 1945 and I am sure some of you gentlemen are members of the legal profession yourself. In determining what is or is not constitutional, it requires the skill of a lawyer.

In this day and time he has to be awfully good to even anticipate what is coming next.

Mr. MEADER. May I underline that.

Mr. MONAGAN. Maybe a psychiatrist is best qualified.

Mr. INBAU. For this psychiatrist to embark on this area is typical of what has been going on generally in the field of psychiatry. Again I say what this gentleman ought to do other than sit down in his armchair or lie down on his couch and speculate on this, he ought to go to some place where these tests are being conducted and find out what actually is going on.

At one time it was said that the bumblebee according to the laws of aerodynamics should not be able to fly, but the bumblebee hadn't heard about this and went ahead flying anyway. Let me give you another example. I would like for the record to show it because so often we get taken in by this kind of an opinion from someone who doesn't know what he is talking about.

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Mr. MEADER. I can appreciate all that, Doctor. I think you ought to comment on the fourth and fifth amendment.

Mr. INBAU. I may be trying to cover too much territory, I agree.

Mr. Moss. Mr. Inbau, the Chair would like to make this observation. Being fully qualified, a lay member in both law and psychiatry, I think any citizen or any thinking person has a right to express a personal conviction.

Mr. INBAU. Oh, sure.

Mr. Moss. I would say he is undoubtedly as well qualified in law as many who operate polygraphs are in physiology and psychology. I think it would be far more productive if we direct ourselves merely to the merits of his dicussion rather than to the substantive nature of his own opinion.

Mr. INBAU. With respect to that, as his letter points out, one of the answers to it is that the individual is not forced to take this test. That is one aspect.

Mr. MEADER. How about the point he makes that you are examining not only his conscious but his subconscious? He is not aware that his subconscious is also to be examined.

Mr. BACKSTER. May I comment on that, sir?

Mr. MEADER. Yes.

Mr. BACKSTER. First I can only comment as an expert in polygraph and not on the merits of his observation as a psychiatrist. In not one single case in nearly 17 years of full-time usage of the polygraph have I found this to be true. That I can comment on.

Mr. MEADER. Which to be true?

Mr. BACKSTER. The comment that the psychiatrist made about something unknown to the subject coming forth on the records, delving into his subconscious, as well as his conscious. Not even concerning the aspect of delving into subconsicous phenomena, have I found one single case where that possibility exhibited itself as a problem area, in 17 years of full-time usage of the polygraph.

Mr. Moss. Mr. Backster, I would refer you to a rather carefully written article by Dr. Dearman and Dr. Smith which you have previously indicated you have read and are familiar with. He deals in great detail, in very finite detail, with the nature of subsequent examinations undertaken on this young bank teller to determine why they had received the responses which had led to his signing a confession.

Again, professing no expertise in the field of psychiatry, I would say that it appears to be a very rational detailing of events which could certainly occur. And they would indicate the exact opposite of what you have just stated, because there was here a subconscious involvement.

Mr. BACKSTER. Sir, there well may have been a subconscious involvement but the question does still remain unanswered as to whether the subconscious involvement was that which showed on the polygraph charts. From a polygraph examiner's standpoint, I think that we have a much more simplified method in which to criticize the entire examination that was given and successfully so, too.

Mr. Moss. But the point that Congressman Meader was dealing with was the statement by the doctor, which I think perhaps should be read again, "In my opinion the use of the polygraph violates the fourth

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amendment as regards search and seizure. I am also of the opinion that its use violates the fifth amendment."

It is to these points specifically that the questions of Congressman Meader are directed. I think it would be helpful if you would respond only to those points at this time.

Mr. BACKSTER. May I state that I would like an opportunity to respond on the other points which I started on prematurely, and also state that I am not in any way qualified to testify on the points you have just raised right now.

Mr. Moss. Fine.

Mr. INBAU. I have gone into this as a criminal law teacher since 1945. I have tried to be on top of this situation with respect to the constitutionality of these techniques as well as others. I see no involvement here of search and seizure. Certainly in the traditional sense it is not a search and seizure. Since the individual is not compelled to take the test, and that is another basic principle with respect to the use of this technique, I don't think we are encountering any constitutional difficulties here, at least as matters stand at the present time.

The Supreme Court could well come up and say that at any time you explore into the mind of somebody it is unconstitutional. By the same token it seems to me a psychological examination given to an employee, industry, Government or what have you, to find out whether he is stable, involves an intrusion into this person's will, into his mind, his subconscious.

The psychiatrists themselves are doing this and doing it in industry and in Government. It seems to me if you want to avoid constitutional issues completely let us do away with all of these things. It is also an invasion of privacy when you check on what the neighborhood thinks about this particular individual and what they know about him. That is an intrusion on privacy. Let us label it all unconstitutional.

Mr. MEADER. Let me ask you this, Doctor, to get right down to this specific point. When the consent of the examinee is obtained, is he warned that the questions may elicit unconscious reactions as well as conscious answers?

Mr. INBAU. Yes. In any properly conducted test the individual knows what the subject of the investigation is. He knows precisely what questions will be asked him. It is not bringing out these deep-rooted unconscious things. It is coming up with something very specific. Have you ever stolen from a place where you worked? Did you steal this particular item? That is not digging down deep into his unconscious. That is on his conscious mind, as to whether he stole it.

Mr. MEADER. I would assume that no examiner has ever warned an examinee that we are asking questions which may bring out unconscious reactions.

Mr. JOHN REID. I don't believe they will, sir.

Mr. LINDBERG. There is no evidence.

Mr. JOHN REID. Absolutely not.

Mr. BACKSTER. Sir, concerning the procedure which you suggest, as a practicing examiner and testifying as an expert polygraph examiner, I have never done so and hope I will never be caused to do so because there is not one element of proof that this is the case.

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Mr. LINDBERG. It is speculation only. Let me suggest, Congressman, if I might, that Dr. Dearman's article be given the probative value that should be given to an exploration of one single case. I might point out that Dr. Dearman was not known to this field, nor have I ever found a polygraph examiner who was consulted by Dr. Dearman, as is the case also with the Harvard Business Review expert.

I know of no polygraph examiner who even had any connection with Dr. Dearman whatsoever. As far as I can see, his is strictly an ex parte investigation with no relevance to the field of polygraph examinations as it exists in the United States today.

Mr. Moss. Mr. Meader, we have a quorum call that commenced a few minutes ago.

Mr. MEADER. May I just ask, to close this, these gentlemen if they would like to submit anything further in writing on the constitutional point raised by Dr. Dearman, or if there are any articles on constitutionality generally.

Mr. INBAU. That issue is discussed in part in this book of ours.

Mr. MEADER. Would you make references that could go in the appropriate part of our hearings?

Mr. INBAU. Yes, I will.

Mr. Moss. The Chair is requesting all witnesses to return at 10 tomorrow morning. Members have additional questions. We hope to conclude with you gentlemen tomorrow morning so that we can start with other witnesses tomorrow afternoon.

Congressman Reid, you will be recognized immediately following the conclusion of Mr. Meader's questions tomorrow.

Mr. INBAU. Mr. Chairman, the legal status and the legal issue regarding the lie detector technique are in this book of ours at page 122 on.

Mr. Moss. The staff will identify it for the members.

We have to leave now because of the quorum call.

(Whereupon, at 11:13 a.m. the subcommittee recessed, to reconvene at 10 a.m. Thursday, April 9, 1964.)

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USE OF POLYGRAPHS AS "LIE DETECTORS" BY THE FEDERAL GOVERNMENT

(Part 1—Panel Discussion With Private Polygraph Petitioners)

THURSDAY, APRIL 9, 1964

HOUSE OF REPRESENTATIVES,
FOREIGN OPERATIONS AND
GOVERNMENT INFORMATION SUBCOMMITTEE
OF THE COMMITTEE ON GOVERNMENT OPERATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., pursuant to recess, in room B–300, Rayburn Office Building, Hon. John E. Moss (chairman of the subcommittee) presiding.

Present: Representatives John E. Moss, Henry S. Reuss, John S. Monagan, George Meader, and Ogden R. Reid.

Staff members present: Samuel J. Archibald, staff administrator; Jock Mattison, chief investigator; and Benny L. Kass, subcommittee counsel.

Mr. Moss. The subcommittee will be in order.

At this time I recognize the gentleman from New York, Mr. Reid.

Mr. OGDEN REID. Thank you, Mr. Chairman. Good morning, gentlemen.

Mr. Inbau, I want to go back slightly over some of your testimony on Tuesday and the general question of standards with regard to the use of the polygraph. You stated initially that you thought it was an indispensable investigative aid and a basis of a technique for diagnosing deception.

You also said, just as with any medical instrument it is of no value, in fact it may be a very dangerous thing, in the hands of someone who is not trained in the technique of making the diagnosis. Then, if the transcript is correct, when you were asked about the general subject of qualifications, you indicated the following:

> Yes, that is difficult. Let us face it, of the people who are utilizing this device today in my judgment about 80 percent of them are not measuring up to what standards we feel are required.

I was wondering whether you would care to comment on that because if some of this 80 percent are some of those that are using it in the Federal Government, if 80 percent are not adequately trained and if the instrument in the hands of unqualified persons could be dangerous, that seems to me to be a matter of rather serious concern.

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FURTHER TESTIMONY OF FRED E. INBAU, NORTHWESTERN UNIVERSITY SCHOOL OF LAW; ACCOMPANIED BY CLEVE BACKSTER, BACKSTER SCHOOL OF LIE DETECTION, NEW YORK, N.Y.; JOHN E. REID, JOHN E. REID & ASSOCIATES, CHICAGO, ILL.; AND GEORGE LINDBERG, JOHN E. REID & ASSOCIATES, CHICAGO, ILL.

Mr. INBAU. The figures I have there—and again I don't present that as a statistic that I could support, it is just my estimate, and I think that is shared by Mr. Reid and Mr. Lindberg; that is across the board. I am much more familiar with the situation in police departments and among private investigators, much more familiar with that, than I am as regards the military and governmental operations or utilization of the technique.

The extent to which a figure could be struck, an estimate, if you restrict it to the governmental functions, that I wouldn't dare to say, although I am quite confident that across the board that figure represents a fairly accurate estimate.

Now within the Government, as I see the data that was presented to us, I find in there that certainly a percentage of the people don't measure with respect to educational qualifications, which I consider a very necessary set of qualifications, or one of the necessary qualifications.

To the extent that they don't measure up on that, I would say that the probabilities are there, is a considerable percentage within governmental operations who are not measuring up to the standards that we think are required for the effective utilization of the technique.

Mr. OGDEN REID. Then might I ask you—and I am not concerned whether it is 80 or 70 percent—I take it from your inference that there are a substantial number that may not meet what might be considered minimum or adequate standards of training or perhaps even maturity in the use of the polygraph.

Would you care to deal rather more specifically with the kind of standards, the kind of training program, that you think should apply in the Federal Government. I know there has been talk of the need to train an individual for 6 weeks or 6 months. We had testimony of a doctor yesterday who said perhaps it should even be 8 years.

What would be, in your judgment, minimal and adequate safeguards—and when I say adequate, I mean adequate in the sense that the operator will be fully trained so that the rights of the individual will be as fully protected as possible.

Mr. INBAU. In my judgment it would require a period of apprenticeship training of approximately 6 months. By apprenticeship training I mean the individual would receive instructions, would receive case experience, day in and day out of the working days, under the guidance and supervision of an experienced, competent examiner, one who had a sufficient caseload to give this kind of apprenticeship training.

In my judgment it can't be done adequately by schooling and certainly not the kind of schooling that prevails in some quarters of 6 weeks.

Mr. OGDEN REID. Could we try to define a little more precisely the several standards. Perhaps any of you gentlemen may wish to com-

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ment. You feel that as a minimum there should be a college degree?

Mr. INBAU. Yes.

Mr. OGDEN REID. Added to that should there be any kind of medical or psychiatric training?

Mr. INBAU. You mean on the part of the individual?

Mr. OGDEN REID. I was trying to start first with the minimal training and the selection of the individual, and then with the length of internship, if you will, that would be required.

Mr. INBAU. Congressman, on this point I would defer to Mr. Lindberg, because the views he expresses on this I know are mine and he can answer you a little more specifically.

Mr. LINDBERG. Congressman Reid, I was somewhat prepared for this question because I think it is the essence of this hearing. So I have prepared what we have agreed will be the minimal standards in the areas that you suggest. I will read them.

Mr. OGDEN REID. Thank you.

Mr. LINDBERG. Then we can go back and discuss certain of them. The most significant assistance in establishing polygraph service of the highest caliber would be to reevaluate the selection and training of examiners in the Federal service along the following lines:

Select only those persons who (*a*) possess a degree at the baccalaureate level; (*b*) who regardless of prior investigative background have a tested scientific aptitude and a desire to become a career examiner; and (*c*) who have reached 21 years of age and display a stable and mature attitude; and (*d*) who will undergo a polygraph examination regarding previously undetected acts of gross criminal behavior or continuing pattern of antisocial behavior.

Then establish uniform training programs which, (*a*) teach the scientific assessment of truth and deception, rather than the interrogative features of the procedure; (*b*) which permits and insures that the student will participate in no less than 500 actual examinations over a period of at least 6 months; and (*c*) which provides immediate personal supervision for 6 months after the initial 6 months of formal internship; and (*d*) which includes supplementing the trainee's standard college courses in the fields of physiology and psychology with specific information from these sciences as it relates to the detection of deception; and (*e*) which affords the trainee opportunities for independent research and study and also requires such research; and (*f*) which will accurately test and classify the trainee's competency at the end of the 6 months' formal internship and the 6 months' supervisory internship.

Mr. OGDEN REID. Thank you, Mr. Lindberg. I think it is very helpful to get that on the record. Might I direct a question to the points you raise. Dr. Dearman had this to say:

> They claim this can be done with a man with only 6 weeks' training and 6 months' experience in the use of the polygraph. The training of the roentgenologist and internist requires about 8 years.

Specifically here he notes that the polygraph recording is a recording of the blood pressure, pulse, respiration, and sweating of the skin and its interpretation is certainly as difficult if not more so, than the interpretation of an electrocardiogram. This I assume to be something of a medical judgment as to the need to know the systems of the body, the physiology, metabolism, and the like.

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Would you care to comment on Dr. Dearman's statement that the interpretation is as difficult, if not more so, than an interpretation of a cardiogram?

Mr. LINDBERG. Yes. I can take part of the comment on that. I would certainly differ with Dr. Dearman on that issue for this reason. In the course of conducting over 30,000 polygraph examinations, as we have done in our laboratory, we are not confronted with the complexities which arise from these neurological or cardiology recordings, as in the case of the electrocardiogram that Dr. Dearman suggests occur in the polygraph test.

I think if Dr. Dearman were to study a polygraph facility in detail he would find that his suggestion is not correct.

Mr. OGDEN REID. Yet if I understood the testimony yesterday, there is a figure mentioned that Mr. Reuss developed of 18.9 percent of the tests carried out by the polygraph which were susceptible to subsequent affirmative checks either as to innocence or as to guilt.

There is also some testimony as regards the accuracy of the polygraph in the first instance, quite aside from whether it is susceptible to subsequent confirmation. If there is some difference according to some judgment, there is a rather substantial area of potential error. Doesn't this suggest that we need much more stringent standards and perhaps very real medical knowledge of the use of this instrument?

Mr. INBAU. May I make a comment on that, Mr. Reid?

Mr. OGDEN REID. Yes.

Mr. INBAU. The polygraph examiner doesn't have to know what particular physiological defect is present here. He can make an appraisal on the basis of the appearance of the individual, his general behavior, the nature of the tracing, as to whether that person has anything wrong to a sufficient degree to interfere with this limited kind of testing, namely: Is he lying or telling the truth about this particular matter?

As Mr. Lindberg said, it is far less complex than making a medical diagnosis of a person to find out what ails him. We are not confronted with the same complex determination that confronts a neurologist, a doctor, a psychiatrist. It is of a very limited nature. We certainly disagree on the point that somebody ought to have 8 years of training and all these phases of medical science.

Mr. OGDEN REID. Am I correct, Mr. Inbau, that the multiple-unit polygraph measures blood pressure, pulse, respiration, and galvanic skin responses, and am I not also accurate in stating that the way the question is asked is not dissimilar from the reaction of polling? In polling there are all kinds of bias errors depending on whether the question has various nuances or whether it is a loaded question. So you are talking right at the beginning with four medical variables plus the accuracy and the objectivity of the questions.

It seems to me this calls for rather sophisticated background to use it with any degree of real reliability.

Mr. INBAU. It does call for a degree of sophistication but I don't think to the extent that the psychiatrist you referred to has suggested.

Mr. LINDBERG. Might I add, if I might, Congressman Reid, that on the cases which have been verified, as you pointed out, the figure is 18.9 percent. Try as we may, we can't seem to get more verified than that. But of the 18.9 percent, we were in error in less than 1 percent of those cases. It means 1 percent of 18.9 percent.

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It seems to me the statistics speak for themselves in that regard. Of course, considering the limitation of statistics. But the fact of the matter is that if expert polygraph examiners did suffer the limitation that you suggest, it seems to me that the record would not show the tremendous successes we have had in the field of detecting deception.

The fact of the matter is that we run perhaps 5,000 cases a year in our laboratory alone, and if we did not have the sophistication that you are suggesting, I am sure our office would be in a state of chaos.

Mr. OGDEN REID. Of course, what I think this hearing in large measure is directed toward is not whether this has been used in a few instances by highly skilled professionals, but whether it has been used properly in the Federal Government, whether the individual has been given adequate protection of his constitutional rights. Also, in pursuance of the analysis of the polygraph, whether the Government has any kind of what might be called minimum standards that are at all adequate in the professional terms you are talking.

I gather it is the judgment of you gentlemen that the standards in the Federal Government today, from what you know of it, do not measure up, and that they indeed may be dangerous.

Mr. INBAU. Congressman Reid, may I offer this suggestion, and I offer it on behalf of Mr. Reid, Mr. Lindberg, and myself. I had not conferred with Mr. Backster on this, so he can speak with reference to it if he wishes.

We would like to suggest to this committee that it recommend to the various governmental agencies utilizing the technique that a committee be established—an intergovernmental or interdepartmental committee—to look into this matter of examiner qualifications, standards, the type of questions that should be asked, what limitations should be imposed upon them, and that intergovernmental committee call upon people such as those of us here at the panel, and certainly the three of us volunteer our services for that, to see what could be developed by way of some standardization with respect to all these various facets of the polygraph technique.

It seems to me it is important that that be done and at the earliest possible moment.

Mr. OGDEN REID. Has there ever been a suggestion made by any of you gentlemen that such a committee be established? Do you know whether there has been any progress made in that direction?

Mr. JOHN REID. Mr. Reid, I would like to answer this. In fairness to the representatives of the Army, a year ago they invited me down and they were most anxious to establish some standards for the field, at least in their area. They are looking to that and I think they would welcome it.

Mr. OGDEN REID. Do you know if any of the groups that were mentioned yesterday, such as the International Association for Polygraph Research, American Academy of Polygraph Examiners, Academy of Scientific Investigators, and others, sought to establish minimum standards in any kind of consultation that would apply to the several users in the Federal Government?

Mr. JOHN REID. We have a standard of principles set down, but I don't think we have required each individual to practice our technique.

Mr. OGDEN REID. Do you know whether any of these groups have met with the Federal Government at a top level to try to develop overall standards?

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Mr. JOHN REID. I think Mr. Backster has met with them.

Mr. BACKSTER. May I comment on that?

Mr. OGDEN REID. Please.

Mr. BACKSTER. In the folder that you have before you is an article which if you will refer to is entitled "Polygraph Professionalization Through Technique Standardization." This article is reprinted from the April 1963 issue of Law and Order magazine, published by the Copp Publishing Co. of New York City.

In this article, the situation, I feel, is quite adequately put on the line as far as the profession is concerned and suggestions are made as to that which could be done and should be done. These suggestions revolved around the use, by examiners in the field, of a standardized polygraph examiner notepack, which was to be provided and has been provided by our research efforts at my school in New York City to all examiners in the field at an actual printing cost-plus-postage basis.

To date 13,000 of these note packs have been disseminated at the request of people in the field and are in use. A number of the schools are teaching the use of the notepack in regard to a standardized approach and the Zone Comparison test connected with it. Fort Gordon has featured this test in the training of governmental personnel and we have used this technique to train military and Government personnel in our school in New York.

Mr. OGDEN REID. Mr. Chairman, I wonder if it would be in order at this point in the record to insert pertinent portions of the committee print which pertain to educational requirements and the length of time required for training.

Mr. MOSS. Without objection that portion will be inserted in the record. (See exhibit 3, p. 156.)

Mr. OGDEN REID. Thank you.

Mr. BACKSTER. Sir, may I make a comment on that particular aspect?

Mr. OGDEN REID. Yes.

Mr. BACKSTER. Having been a director of a 6-week school continuously since 1951, at this point a few words could be said on behalf of the 6-week training, plus the 2 years supervision of the individuals once they go out in the field. This is accomplished by virtue of a work project which includes their mailing in typical cases on which comments are made and returned to the examiner in the field, thereby keeping some supervision over him and in connection with which free attendance, tuitionwise and supplywise, is offered to the work conferences that are held during the 2-year period at a minimum. This is done in order that he can keep up to date on the training and the new technique facets being introduced in the field.

After listening to the standards that have been set up, I am a little amazed how we can excuse away the success of the 6-week graduates that have graduated by virtue of 6 weeks' training, including a sizable number of the individuals that belong to the organizations that Mr. John Reid has fostered and developed.

These people were 6-week trainees themselves. I know, because I have trained a number of them myself that are members of that organization. They seem to be doing very well. I am wondering how we can explain this. Actually my experience has been that a sizable number of 6-week graduates receiving adequate supervision at

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the field level, have done very well as far as success is concerned and are reported to be excellent polygraph examiners.

Mr. Moss. Mr. Backster, what is the basis for the 6-week trainee? What requirements have you in selecting a person for that training?

Mr. BACKSTER. These requirements are outlined by the University of the State of New York who provides our private trade school supervision and they are also in the folder before you. (See exhibit 6, p. 183.)

Mr. Moss. I would prefer to have it stated by you as succinctly as possible for the record at this point. Briefly, don't you have them in mind?

Mr. BACKSTER. Yes, sir.

Mr. Moss. That is all I want.

Mr. BACKSTER. The State requires that a person who is nonsponsored by Government agency or military service have 2 years of college as indicated by 60 credits transmitted directly from the college concerned to our school.

The individual who is sponsored by a governmental agency needs to have a high school diploma or an equivalency certificate in order to be admitted if he is being sponsored by his governmental or military organization concerned or law-enforcement organization concerned.

In addition to that there is an age minimum of 21, I believe. I would have to refer. It is either 21 or 23 years old. Also, the private sponsored individual must have an interview with school officials during which it is ascertained whether he is desirable in our opinion for acceptance in the school.

Mr. Moss. Then the educational qualifications briefly stated?

Mr. BACKSTER. Two years of college if nongovernmentally sponsored, a high school graduate, or a person having a certificate demonstrating equal knowledge if governmentally or law enforcement sponsored.

Mr. OGDEN REID. Mr. Chairman, I just have two more questions of Mr. Inbau, if I may. If a polygraph is put in the hands of an untrained individual or not sufficiently trained, as we have said earlier, you commented it is dangerous.

Would you, therefore, say that this instrument should not be used either by individuals or an agency in the Federal Government in the absence of adequate professional standards?

Mr. INBAU. Yes. Congressman, sometimes a police department or other agency may recognize that it will only be used as a psychological gimmick for inducing confessions from the guilty. If it is used as an interrogation prop and nothing more is expected of it, and if you are not using it for the detection of deception as such, then perhaps it may be all right to use it if it is generally recognized that is the limitation.

But we are talking here about detection of deception and consequently, for that purpose, I think the statement I made before correctly represents my views.

Mr. OGDEN REID. Then in pursuit of that, in terms of unclassified figures, we know there is something on the order of 512 polygraphs being used and I think the classified information would indicate that a substantial number in excess of that are being used in other areas.

Obviously they are concerned with some areas of deception. Therefore, if that is true, your last statement, and the fact that perhaps 80

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percent or a substantial number are not sufficiently trained, that means in the Federal Government today it might well be that a majority of those using the polygraphs are not trained and the use of the polygraph by those individuals or agencies should be discontinued forthwith until a governmental panel could be set up to establish standards or until it was determined there was feasibility and need for it.

Is that a fair statement?

Mr. INBAU. I don't know that I would be as drastic as to say discontinued forthwith.

Mr. OGDEN REID. Would you suggest that they continue if we have agency X which has a substantial number, and we will say that their examiners have had unsatisfactory training, a 6-week course, and inadequate educational background? Would it not be your recommendation that they stop use of the polygraph until such time that professional standards are determined. Alternatively, should they use the polygraph at all if they cannot hedge it in with adequate safeguards?

Mr. INBAU. I think in view of what I said in the hands of an untrained person if it is used for the detection of deception and decisions are made upon that basis, there is danger in an agency tolerating the testing where you have ill-trained, incompetent examiners.

What I am concerned about and was many years ago and voiced myself on it both orally and in writing, I would have some fear for the safety of this country if a person of the type we consider inadequately trained, incompetent, making a decision that this person is trustworthy in this particular sensitive position, if they were giving a considerable weight to the results of a polygraph test.

On the other hand, of course, as he mentioned earlier it can be hurtful to the individual himself and unfair to him, as I say, while I express these views I am not out for pulling the rug from out of this thing at once. I think it could be done gradually. We have put up with this for a number of years.

What I would like to see is to have this transition come about rather gradually and perhaps we would fare out a lot better than just putting a complete stoppage to it at this moment.

Mr. BACKSTER. Mr. Reid, I would like to comment if I might. How many individuals have received—and I don't know whether it is proper to direct a question to my copanel members—how many individuals have received this 6 months' training of the 2,000 or 3,000 examiners that exist in the field today?

Mr. OGDEN REID. I would suggest that Mr. Kass might want to respond to that. I don't have the precise figures in front of me. But I think our information, as evidenced in the table in the committee print, is that perhaps a substantial majority of those conducting these tests do not meet the standards that you gentlemen have mentioned this morning.

Mr. KASS. That is substantially correct.

Mr. BACKSTER. The standards that the gentlemen mentioned this morning do not include my views on the standards as far as the length of the training course is concerned. So we cannot preclude that 6-week trained individuals are automatically inadequate in the field.

Mr. OGDEN REID. Would you hold that there should be a college degree and adequate educational background quite aside from the period of internship?

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Mr. BACKSTER. It would certainly be desirable to have some. It is now not practical in the average police department throughout the country.

Mr. OGDEN REID. We are not talking, Mr. Backster, about the average police department. We are trying to protect the rights of the individual in the Federal Government. The question here is whether the Federal Government has adequate standards. If they do not now have adequate standards, should they not stop the process until they can review the whole matter and determine what is valid? I would like to ask Mr. Inbau just one final question.

Mr. BACKSTER. May I finish my comment?

Mr. OGDEN REID. Yes.

Mr. BACKSTER. I would like to state for the record without reservation that it is not my opinion that a 6-week course, plus the supervision period during the 2 years of field project work and the advanced training through work conferences that are available, are inadequate.

I would like to again ask if I might, the only source for the 6 months' training is Mr. John Reid's school itself, how many 6-month trainees he has graduated?

Mr. OGDEN REID. I believe that the presumption must be, and the responsibility of the Federal Government must be, that we are protecting the rights of the individual as well as the best interests of the Government of the United States. While Government service is a privilege and not an automatic right, on the other hand, I think most of us who are concerned with civil liberties would never uphold any process that we thought was an infringement—technically or otherwise—of basic rights of due process.

I think we have a situation here today from what we have been able to determine in the committee and the standards your gentlemen in general subscribe to—either initially in terms of college education or subsequently in terms of internship, where you disagree a little bit—a situation substantially where we have widespread use of polygraphs, and a majority of these polygraphs apparently in the hands of individuals who may not or, in fact, do not have sufficient training.

I think that is a reason for concern. I would like to ask Mr. Inbau one final question.

Mr. BACKSTER. I didn't finish my point, for the record.

Mr. OGDEN REID. Let me go back to Mr. Inbau for one final point.

Mr. Moss. The Chair would like to make this observation to any of the witnesses. The purposes of witnesses before this committee is to develop for the committee the information which it, in its judgment, requires. As a member undertakes a line of interrogation, he determines whether your response is adequate to satisfy him. If he is satisfied, it is not necessary that the witness also be satisfied.

Mr. BACKSTER. Sir, may I submit in writing supplementary material?

Mr. Moss. Any request you might have for amplifying your testimony in any manner can be made in writing to the chairman and it will be considered by the committee. For moving along smoothly here, Mr. Reid has the right to determine whether the response is adequate for his needs.

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Mr. OGDEN REID. Mr. Backster, trying to clarify this so that you feel that your point of view is fairly presented, as I understood the thrust of your question and comment, you were concerned with the 6-week training period and the adequacy thereof.

Mr. BACKSTER. Yes, sir.

Mr. OGDEN REID. I think what we are trying to determine here this morning is the question of overall standards, particularly as they apply to the Federal Government relating to both educational background and maturity and a period of internship. As I understand it, you have said that you think a college degree is desirable, where I think the other gentlemen have more nearly suggested that it was virtually essential.

You have indicated that you think a 6-week training period should not be precluded, whereas the other gentlemen on the panel have tended to suggest that a longer period was required for truly professional standards. Is that a fair statement of your position, or do you want to add to it?

Mr. BACKSTER. May I comment on it?

Mr. OGDEN REID. You may indeed.

Mr. BACKSTER. Sir.

Mr. MOSS. Yes.

Mr. BACKSTER. The reason I took issue with this is because of a statement you made earlier in the record already concluding that a 6-week training period was grossly inadequate or improper.

Mr. OGDEN REID. I am not professionally competent to say what is adequate or not. I am just saying that the trend of the testimony suggests that we need uniform and higher standards than appear to be the case. Exactly what those standards are is one of the reasons for this inquiry in this hearing this morning.

I am not trying to prejudge it but the burden of the testimony this morning is that we need higher standards. One member of the panel, Mr. Inbau, said it may be a figure as high as 80 percent of those in Federal Government who are not adequately trained. We are not trying to pick a particular figure but merely indicate that a substantial number, whether it is 30 percent or 50 percent or 80 percent, may not have adequate training.

I am not trying to make a precise judgment as to where that line is. Could I ask Professor Inbau one final question and conclude. If we are faced here with the situation where the training standards do not appear to be adequate in some instances, whatever the figure is, and if we are faced with some judgment that the utilization and operation of a polygraph takes very substantial and sophisticated training and further there are areas of potential error, should there not in a legal sense also not be some means of review of utilization of a polygraph test or some means whereby the rights of the individual can be more fully protected than could be the case?

Have you given any thought to what kind of review mechanism within the framework of the interests of the Government on the one hand and the constitutional rights of the individual on the other?

Mr. INBAU. I am not sure, Mr. Reid, I understand the full import of your question when you say review. Do you mean as to the report in every given case?

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Mr. OGDEN REID. As I understand it, if you are having either preemployment or postemployment inquiry, you have an investigation. At a certain point in this investigation the individual is apprised that it would be appropriate for him to take a polygraph test. It is true that he has the right to say no, but if he says no, this obviously does not enhance necessarily his posture, the way some of these cases have proceeded.

Therefore, it is not wholly a voluntary process. He, in effect, has to submit to a polygraph under certain circumstances. It is clear that sometimes the polygraph operator is either insufficiently trained, or the machine itself may admit of error, or the totaling up of the evaluations of the responses may admit of error.

I was addressing this more from the standpoint of the rights of the individual. The question is, Should there not be some kind of a review mechanism in the use of these polygraphs that would protect the individual more fully in the Federal Government?

Mr. INBAU. I would think that within the agency there would be some review. Take the case you just mentioned, the individual refuses to take the test, for instance. On this matter of the significance of a refusal, I would like to answer the question in the context of the framework of the particular kind of case under investigation.

It seems to me if you have a case where it is a question whether this individual did this particular act that involves a crime, it is an isolated instance, let us say in police circles, a refusal there may be subject to inference different I think than what we could subject it to in governmental operations, where you have the individual on one side and governmental security on the other.

I would say if the individual there refuses, the kind of supervision that ought to be involved here is to inquire as to the reason for the refusal. Some people may have a good reason for it. He may well say, I don't trust the quality of the examiner conducting the review. I don't trust the instrument that is being used.

In one governmental agency they have been using the galvanic reflex. If any friend of mine or any individual came to me for advice as to whether he ought to subject himself to a test on a galvanometer I would say refuse. I think that individual is entitled to have some consideration given as to the reason for his refusal, and I think in that case he has good and sufficient reason for refusal.

On the other hand, if he is before an agency which is using a polygraph, has an individual or a group of individuals competent to conduct the examination, and he refuses, just a flat refusal without any reason for it, I would say, weighing the rights of the individual against the security of the country, that that refusal ought to be given a significance that would be inimical to the best interests of the individual.

Mr. OGDEN REID. But also should there not be a review mechanism on the general professional expertise in the use of a series of polygraph examinations, reviewed at a certain technical level, because I think every one admits the possibility of error in diagnosis, regardless of whether the finding is plus or minus.

Should there not be a review mechanism from the technical as well as from the rights of the individual standpoint?

Mr. INBAU. I would like to refer that to Mr. Lindberg, if I may.

Mr. OGDEN REID. Yes.

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Mr. LINDBERG. As a practical matter, Mr. Reid, the suggestion that you are making is a thing that does actually happen in our laboratory and many other labs around the country, wherein the results of one examination are in fact reviewed by a panel of three or more colleagues of that particular examiner.

Many times, for example in our laboratory, if there is a dispute among the examiners as to the significance of a particular pattern of reactions, the subject is brought back for a reexamination. But in every case the final conclusion is the result of a panel of examiners. This affords the subject a considerable amount of protection.

Mr. OGDEN REID. To your knowledge, Mr. Lindberg, is there any such review mechanism operating in the Federal Government today?

Mr. LINDBERG. Only from my casual knowledge of the operations, I think there is an informal review of every case subject. Obviously no examiner wants to make a mistake on anybody. He would seek the assistance of his colleagues in rendering any significant opinion.

So I do believe as a practical matter it does occur. I might suggest, however, that the main area for the protection of the individual is in the agency's limitation of the scope of the inquiry. We are well aware, both in private industry and in Government, that inquiries are made that don't have any direct relevance to the issue of security.

I think in fairness to the rights of the individual, the scope of the inquiry should be the first matter of business of any committee.

Mr. OGDEN REID. To sum up, may I ask this of you gentlemen, severally? Is it your joint conclusion that there should be set up at the earliest date an intergovernmental committee to set up what would be minimum professional standards?

Second, that this consideration or this committee should consider the right of an appropriate review panel, either from a technical standpoint or from the standpoint of the individual?

Third, Mr. Inbau, am I correct in assuming that you think where there is clear evidence today that the operators are unqualified that that agency or department should either go extremely slow in the use of the polygraph, or terminate it until such time as adequate standards can be developed?

Mr. INBAU. That correctly explains my position. May I add one thing here in fairness to Mr. Backster, and I certainly feel he is entitled to this, with respect to the 6-week course, when we say—and I represent Mr. Reid's and Mr. Lindberg's views—that we think 6 months is the right time for someone to be trained under this apprenticeship system we are talking about, we think that is what it ought to be.

In saying that, we don't mean to suggest that every person who has come out of Mr. Backster's school or any other schools with 6 weeks is for that reason incompetent. Following that 6 weeks, if over a period of time he does acquire skill in the practical operations, with some kind of supervision, say over a 2-year period, at the end of 2 years he may well be a competent examiner.

I think there are some people in this country today who have developed into competent examiners. What we are objecting to is to have a man go to a 6-week school—and I know of one such school—where they don't get this kind of postgraduate supervision, shall we say, of this individual planted in a governmental agency or some other police department or what have you, or in private industry, and let

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him at the end of that time start making these kinds of serious judgments.

That is what we are opposed to. That is where I think there is a real danger, both as to the governmental agency, if it be a governmental agency, and to the individual who gets into the hands of a person with that kind of training.

Mr. OGDEN REID. I understand that exposition of Mr. Backster's point of view, but might I return to one point you said in your testimony, that there may be as many as 80 percent of examiners in the Federal Government who are not sufficiently qualified, and this, if so, is a very dangerous thing. Therefore, what we are concerned about it correcting that situation in the Federal Government.

Mr. INBAU. If there is a substantial percentage, then certainly it is a matter that deserves some corrective measures at the earliest possible moment.

Mr. OGDEN REID. You said dangerous, so I assume you mean both from the standpoint of the individual and from the standpoint of the overall numbers involved that it is a matter of serious concern that should require prompt action.

Mr. INBAU. That is my view.

Mr. OGDEN REID. Thank you.

Mr. JOHN REID. Mr. Reid, there is one statement I might make here. Regardless of the competency of the examiner, if the agency using this test or if the examiner is not working at it constantly but only a few cases a month, he, too, can be relegated to the incompetent examiners. They should be full-time examiners.

Mr. OGDEN REID. Thank you, Mr. Chairman.

Mr. Moss. Mr. Monagan.

Mr. MONAGAN. With respect to this matter of the extent of the training, is the point not that there may not be competent people who have had the shorter training, but rather the question of the danger that might come from not having the more extensive training? Would you agree with that?

Mr. LINDBERG. That is our position.

Mr. BACKSTER. Sir.

Mr. MONAGAN. I don't think anyone has suggested that some of these people may not do a competent job, but in the broad picture, as I understand it, the point is made that it is more likely that there would be less danger to individuals involved through the broader preparation.

Mr. BACKSTER. May I comment on that, sir?

Mr. MONAGAN. Yes.

Mr. BACKSTER. I don't understand by virtue of these standards that are so stipulated how with less than perhaps 50 people who have acquired their training by this method, the other 2,000-some examiners have managed to get along.

Mr. MONAGAN. It is not that they have not managed to get along, but it is the degree of competency and the degree of protection to the people who are being tested that is the question here. It has been suggested that protection would not be afforded to the same extent by lesser preparation. I think that has been covered sufficiently.

Professor Inbau, when you were talking about the fourth and fifth amendments, I believe that you raised some question as to the compe-

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tency of Dr. Dearman to testify because of the fact that he was a psychiatrist.

Mr. INBAU. My point was this. I don't know this individual himself and my remark was not directed to him.

Mr. MONAGAN. I know that.

Mr. INBAU. What has been troubling me is this. I will try to answer your question. Would you repeat it for me, please?

Mr. MONAGAN. The question is whether you didn't raise a question as to the competency of Dr. Dearman to testify on the constitutional question because he was a psychiatrist.

Mr. INBAU. Yes, I did.

Mr. MONAGAN. As I understand it, you have been teaching criminal law for something like 25 years.

Mr. INBAU. I have been full time at the Northwestern Faculty since 1945 teaching criminal law.

Mr. MONAGAN. You have been reading the decisions of the Supreme Court in that period?

Mr. INBAU. Yes, I have.

Mr. MONAGAN. Have you ever thought that psychiatric training might not be a pretty good thing to have in following those decisions?

Mr. INBAU. Yes, sir.

Mr. MONAGAN. As I understand your point, though, more seriously, you feel that traditionally the fourth amendment has applied more to the case of physical restraint; that is, taking papers out of a house, or forcibly removing an individual, that sort of thing.

That the fifth amendment has traditionally applied more to self-incrimination and that sort of thing.

Mr. INBAU. Yes, traditionally that has been so, although the Supreme Court in this *Wong Song* case indicated that verbal statements following an illegal arrest are to be excluded for that reason, on the basis of the fourth amendment.

Mr. MONAGAN. Where it is tied in with an illegal physical restraint?

Mr. INBAU. An illegal arrest, yes. With the polygraph technique, the individual is not forced to do this. It doesn't follow an illegal procedure of any sort.

Mr. MONAGAN. I understand.

Mr. INBAU. The test is not given to someone who is unwilling to take it. So I don't think we get involved in the constitutional issue for that reason, unless the Supreme Court comes along one of these days and says that any time you investigate a person it is an intrusion of his privacy and then at that time we better take to the hills.

Mr. MONAGAN. I think when you began your testimony you said that the instrument plays a minor role in this operation. Could you give any rough percentage indication as to what degree that was, or would that vary?

Mr. INBAU. I might relate it to medical examinations. What is a stethocope to the individual using it? To someone untrained in diagnosing illness, it wouldn't mean anything. To a doctor it means a great deal. Just what it means to him would depend upon his skill, drawing upon his training, his experience, his innate skill, or other medical instruments.

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The electrocardiogram and so on, if you give it to an untrained person, it doesn't mean anything. You need it to make a diagnosis, but if you want a percentage, a 10 to 90 percent, the important factor is the adequacies of the individual who is trying to make the diagnosis.

Mr. MONAGAN. You say 10 percent would be the instrument and 90 percent the individual?

Mr. INBAU. Maybe Mr. Lindberg can give you some figures on this.

Mr. MONAGAN. I realize you can't do this with mathematical exactness but I am just trying to get an approximation.

Mr. LINDBERG. The question, Congressman, is obtuse in that sense because it is 100-percent examiner. The results of a polygraph test mean nothing to an untrained person, just as I could not read the stenotype tape that is coming out here. The machine is no good to that man without training, you see. The same with the polygraph examiner. It cannot be relegated to percentages. The examiner can't work without the instrument, the instrument is useless without a trained examiner.

Mr. MONAGAN. It is sufficient to say that the examiner's importance is very, very substantial.

Mr. INBAU. It certainly is.

Mr. LINDBERG. A hundred percent.

Mr. MONAGAN. In the whole operation. There was some discussion on the first day in the case that Mr. Gallagher cited of some questions that were asked of an 18-year-old girl——

Mr. INBAU. A 17-year-old girl.

Mr. MONAGAN. A 17-year-old girl. It was not clear to me and I asked the question at the time as to what function or role a polygraph had in this. Did you understand that the polygraph was involved in that in some way?

Mr. INBAU. As I understand it, what Mr. Gallagher said was that in the course of a polygraph test of this 17-year-old applicant for a governmental position she was asked something about homosexuality and that is what was found to be offensive to Mr. Gallagher and to others.

As Mr. Lindberg pointed out the first day, I don't think it is fair to say that the polygraph examiner is the one at fault there because the agency for which he was working insisted apparently, if this case be true—and I don't know anything about the particular case—that this matter be explored. If they tell him that this is what should be explored he has to go ahead and do it.

Again, as Mr. Lindberg pointed out, these were matters subject to inquiry perhaps even before they began using the polygraph technique. This is one area where we think this committee could set up some standards to determine what are the limitations for this kind of an exploration into an individual's personality.

Mr. MONAGAN. The reason I am asking the question is that as I understood it, your objection was rather broad scaled. But you would concede, would you not, that there would be instances in the Government, particularly in security areas, where a question of that type might well be appropriate?

Mr. INBAU. Absolutely. I trust I made myself clear. I certainly hoped to do so, that I didn't mean to suggest that this is an inappropriate question in all instances. I think it is a matter that should be reconsidered as to whether in a case of a girl out of high school ap-

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plying for a typist job, and as Mr. Gallagher said, in a nonsensitive position, whether you should go into this.

Perhaps reserve it for a later time when this girl is considered for a position that is of a sensitive nature and perhaps maybe there is something or some reason to suspect she might be homosexual. I didn't mean to preclude that kind of inquiry altogether; no, sir.

Mr. MONAGAN. It does point up the need either for agency supervision or regulation or for proper selection of the individual administering the test if in fact the question was his own idea.

Mr. INBAU. Yes, sir.

Mr. JOHN REID. Mr. Monagan, this might be a suggestion, whether it is taken or not, if an applicant for a job in the Government was given the questions or the areas which the polygraph test would cover and allowed to decide whether or not he wants to take this job, whether or not these areas are fair, then he could come and take the test. If the areas are unfair, they should write and say they have another job.

Mr. INBAU. I think what Mr. John Reid is suggesting is that the person applying for a position ought to know just what kind of inquiry he will be subjected to or that will be conducted and how personal it will get and the individual decides before coming into the room to take the test whether he wants to subject himself to this kind of searching inquiry.

Mr. MONAGAN. That is why I did suggest that we get more facts on this case because it is possible that it could be cleared up if we knew the background.

Mr. BACKSTER. Sir, in commenting on that, and also to illustrate that I am not opposed to all aspects of the material presented today as it might seem, I am strongly in favor of regulation that requires each and every question to be reviewed word for word with the person taking the examination before the start of the chart upon which it is used, with no exception.

Mr. MONAGAN. Mr. John Reid, when you testified on the first day, you said something that I would like to ask you to expand on. You said that the instrument does stand in itself and the techniques as a diagnostic instrument giving the examiner the leads as to what points he should look for. Is that a fairly correct statement?

Mr. JOHN REID. Yes; it is fairly correct, sir.

Mr. MONAGAN. Could you give a specific example as to just what you mean by that?

Mr. JOHN REID. In a specific case where we are looking into, let us say, a robbery, a man is suspected of this robbery and he is brought in for a test and agrees to take the test. If there are responses on the control questions that I explained the other day and not on this particular robbery, then after three tests we don't have to go further but just shake his hand and turn him back to the people who brought him in.

Mr. MONAGAN. In other words, the broad question was whether he had ever stolen anything during his vacation or when he was a boy or something of that sort?

Mr. JOHN REID. Yes, sir. But if in the first three tests we find out that he has reactions that are similar one to the other——

Mr. MONAGAN. What would these reactions be?

Mr. JOHN REID. They could be changes in blood pressure, they could be suppressions in respiration. There could be some muscular pressures that the man is applying that normally should not be on the chart.

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It may also be on a control question as well as on the question regarding the robbery. Then it is necessary for us to move that on and it gives us some leads now to find out what we have to do with this person.

Mr. MONAGAN. In other words, he reacts in a certain way to the first question?

Mr. JOHN REID. Yes.

Mr. MONAGAN. His pulse stays the same or something like that?

Mr. JOHN REID. Yes.

Mr. MONAGAN. Have you previously told him that you were going to ask him this question?

Mr. JOHN REID. Everything is previously told.

Mr. MONAGAN. Then you ask the second question and he has been told that he is going to be asked that one?

Mr. JOHN REID. Yes, sir.

Mr. MONAGAN. And you compare the different items, pulse and temperature and so forth, with those that existed at the time of the first question?

Mr. JOHN REID. Yes, sir. As far as the statement is made there, if certain things occur in the test we go on further. If we cannot establish after five tests which responses are the most significant we may ask the man to return for a further examination at a later time. Those are the leads I refer to.

Mr. MONAGAN. In an easy case all of the responses might be different. You might have cases where some responses would be the same and some would be different.

Mr. JOHN REID. Barring a nervous person, sir—an overly nervous person—an easy case is the innocent person. He gives all the cooperation in the world. Whereas the guilty person may very well try to do some mental gymnastics or secret muscular movements to throw the machine off. This may distort the chart.

Mr. MONAGAN. And the subjective judgment of the examiner from demeanor and other evidence is also involved in this final judgment.

Mr. JOHN REID. Yes.

Mr. LINDBERG. Mr. Monagan, if I might suggest that the technique that Mr. John Reid is referring to and the one that is in his 1953 edition of "Lie Detection" is one which uses normal questions to determine what this subject's status is under these circumstances today.

It also has questions which are known lies as Mr. Reid explained before. The unknown issue is the degree of emotional involvement on the hot question. Simply stated, if the subject's reaction—emotional reaction—on the hot question is more similar to the normal, he is telling the truth. Of course, this is over a period of several examinations.

If it looks more like the control question or is in excess of the control question as far as the emotional display is concerned, and this occurs consistently, which is required by scientific method, then the subject is reported as deceptive on that issue.

Mr. MONAGAN. Speaking of emotional involvement, couldn't an innocent person have more of an emotional involvement than someone who was guilty and how do you protect against misinterpretation because of that?

Mr. LINDBERG. Yes. That, of course, is the crux of the polygraph examiner's job. It is the thing we work with every day. The answer

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is that an innocent person is primarily concerned about the control question or questions. There are more than one in the examination. Therefore the focus of his emotional attention is reflected on the control question and not on the murder or the homicide or whatever the specific issue is that he is being questioned about.

This is the heart of the technique. It is a comparative technique. You can say to yourself, it seems to me if I were a subject and I were innocent just the mere fact of walking into the polygraph room would be sufficiently disturbing emotionally that I would react on the theft of the thousand dollars.

But that is not a fact. You will react on the control question as prepared by the examiner with you before the test and you would be declared innocent.

Mr. JOHN REID. In addition to that, sir, 25 minutes or 25 minutes we spend with the subject we spend beforehand in a pretest interview. We attempt to allay all his fears or most of his fears and put him at ease before we start the test—reading the questions, identifying the areas which we are looking into with the subject, letting the subject know that the control question is not to be reported.

Mr. MONAGAN. We have been talking more, I think, about what you might call investigative use in the sense of criminal investigation than any other. But it is true, is it not, that preemployment is an increasing area of the use of the polygraph?

Mr. LINDBERG. Preventive security.

Mr. MONAGAN. How would you say the volume of use there compared with police investigation, enforcement, and so forth?

Mr. LINDBERG. Are you referring to the Federal Government use?

Mr. MONAGAN. I think we should confine it to that.

Mr. LINDBERG. I certainly wouldn't be qualified to say but I would suggest that there is a considerable greater use of it as a screening device than as a criminal investigative device, although I don't speak with any authority on that statistic.

Mr. MONAGAN. Do you have experience which would permit you to say how many people are excluded from employment or what percentage by virtue of these tests?

Mr. LINDBERG. In industry?

Mr. MONAGAN. I think we should confine it to the Federal Government.

Mr. LINDBERG. I don't have any statistics.

Mr. MONAGAN. Let us ask both those questions with relation to industry as long as you do have the figures.

Mr. LINDBERG. Our statistics reflect—although it depends upon the industry involved as to whether it is a financial institution or whether it might be, let us say, a warehouse operation—the general statistics reflect that approximately 30 percent are rejected and 70 percent are accepted.

Mr. MONAGAN. How about the volume of its use in industry, do you have any figures on that?

Mr. LINDBERG. Apparently our statistics for 1963 indicated that about 25 percent of the tests that we conducted involved preemployment assessments. That would be a figure of roughly 1,700 out of 5,000.

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Mr. INBAU. I would just add this footnote, that of this percentage of rejection, it is not based on an opinion of the examiner, but in the course of the examination or after the examination the individual will come up with information which pretty clearly rules him out. For instance, in the case they have had, and it is not too unusual at that, a man applying for a position, one of these check-cashing services where the trucks go around cashing company payroll checks and so on, this young fellow out of the Army several months, applied for a position at this check-cashing agency, and the lie detector technique disclosed he had stolen money and so on. The posttest interview brought out the fact that this boy, between his Army service and the time he applied for this job, had been involved in some burglaries, robberies. Obviously, he is not fit to get on this check-cashing truck. I think in fairness to the individual as well as the company it is better that he works in a warehouse, somewhere where he might not be as dangerous.

Mr. Moss. Would you yield on that point?

Mr. MONAGAN. I would be glad to.

Mr. Moss. The type of information you have just given regarding an application for employment is information which in the course of any well-conducted investigation should have been developed anyway, isn't it?

Mr. INBAU. No, sir; I think these cases that they get, particularly applicants for the police department, have passed all the standard tests. Mind you, this boy had not been arrested for anything. He had not been arrested at all. There was no way in which a check with the neighborhood he lives in and so on would reveal he committed burglaries. This is one way you could find it and I know of no other way in which you could do it.

Mr. LINDBERG. I might amplify if I could, Mr. Moss, on that point, that without the use of the polygraph on an industry a job would go to one of two types of people. Either an honest person who has conducted himself in an honest manner and is entitled to a job, or a highly successful criminal who has not been detected by law enforcement. I don't know what the exact statistics are but it is quite a high percentage. Frequently, these young people, and I am referring specifically to the ones who are applying for police department jobs, some of the people applying for police department jobs, have been extremely successful criminals. They have not been detected as evidenced by one we had a month ago who had committed 400 Chicago burglaries without detection and was applying for a police department job and was highly indignant at this invasion of privacy because he had learned from another policeman who he identified "as much of a criminal as I am," in his words, said as long as you have a criminal record you will get the police department job. This he thought was a trick and an outright invasion of his privacy. He was entitled to keep secret the fact that he had committed these burglaries.

Mr. BACKSTER. Sir, may I comment on this?

Mr. Moss. I will undertake my own questioning later.

Mr. MONAGAN. The only other question I have is whether or not, you, Mr. Backster, can add anything to the answers with respect to the volume of use of the polygraph either in Federal preemployment tests or private or both.

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Mr. BACKSTER. On one occasion or another I have been a consultant to most every Government agency that is using the polygraph today, and I have known at certain times what their volume was and can only estimate what it would be now. I do know that in setting up the program for Central Intelligence Agency and being active in that program for a period of time, that the amount of derogatory material that was uncovered, that was important and uncovered by the polygraph as compared to the field investigation with no reflection on the competency of those doing it at its very best level as far as investigative effort is concerned, was approximately 25 percent of derogatory information uncovered comparing it to the total uncovered simultaneously, and with no coordination of the two procedures. Actually using the polygraph as a theoretical 100 percent—25 percent on an average of that information was uncovered by field investigation.

Mr. MONAGAN. Thank you.

Mr. LINDBERG. They are notoriously unproductive, field investigations.

Mr. MONAGAN. Did you say that one individual had committed 400 burglaries?

Mr. LINDBERG. In the Chicago-land area over a period of approximately 5 years, I believe it was. He was 21 or 22.

Mr. MONAGAN. That is more than one a week.

Mr. LINDBERG. Yes.

Mr. MONAGAN. None had been detected in any way?

Mr. LINDBERG. No. He had also participated in over 50 Chicago-land and Midwest laboratories, one of which there was a John Doe warrant on file for him in Chicago.

Mr. MONAGAN. Was he prosecuted subsequently?

Mr. LINDBERG. No.

Mr. MONAGAN. Why not?

Mr. LINDBERG. The arrangement that we have with the employing agency is that the polygraph shall not be used for the purposes of detecting criminal behavior for prosecution but only for assessing the applicant's qualifications. These people would not make these disclosures if they were concerned that they would be prosecuted the next day for them.

Mr. MONAGAN. What about the duty as a citizen that an examiner would have. Four hundred burglaries is a pretty good number, but you could also conceive of other crimes of a more serious nature. Is there any obligation on the part of the examiner to report such a thing to the police?

Mr. LINDBERG. We don't believe so, Mr. Monagan, and no legislative body has imposed that on litigation that we know of. Professor Inbau may have a comment on that fact. We have confessions of murder and homicide also occurring in our laboratory which are not at issue and they are not disclosed?

Mr. REUSS. Would the gentleman yield?

Mr. MONAGAN. Yes.

Mr. REUSS. I suggest, Mr. Witness, that you are guilty of suppressing quite a few felonies and it is the duty of citizens to report these matters.

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Mr. INBAU. Not under Illinois law. If these were Federal offenses it might be something else. Under Illinois law there is no requirement for the disclosure of this information.

Mr. MEADER. Would the gentleman yield to me?

Mr. MONAGAN. Yes.

Mr. MEADER. Do you think there is a privilege between an examinee and examiner such as the privileged relationship between attorney and client and doctor and patient?

Mr. INBAU. There is certainly no statutory privilege. This information could be obtained from these gentlemen by a court pursuant to a court order.

Mr. MEADER. In other words, if I discovered that Mr. Lindberg had information concerning the commission of 400 burglaries and I should call him before a grand jury he could not invoke the privilege against testifying that an attorney could?

Mr. INBAU. I think that is right because his relationship with this person, even though Mr. Lindberg is an attorney, is not an attorney-client relationship, so he could be compelled to disclose this. Incidentally, in this particular case of 400 burglaries, this doesn't mean stealing furs and this sort of thing. With a young fellow most of those were of a minor nature. It certainly revealed that this individual was not the kind that ought to be employed on the police force. The one case of a breach of this confidentiality, as a case Mr. (John) Reid had and it was a troublesome one and he conferred with me about it, we finally came of the conclusion that this one was of such a serious nature it had to be reported to the authorities. It was a young fellow who committed a very serious arson. He was a menace to the community. I was talking about collective menace because this boy could set fire to a hospital, school, or what have you. In that instance his attorney was urged to disclose this and the attorney refused to do it and Mr. Reid, after considerable soul-searching, did breach the confidentiality in this case. But in the other cases it just can't be done in order to successfully carry out this preemployment screening operation.

Mr. MEADER. The examiner customarily, or as a rigid rule of procedure, always advises the examinee that the statements made will be treated confidentially?

Mr. INBAU. With respect to the control questions and answers. George, do you want to answer?

Mr. MEADER. I mean before you commence the examination, do you assure the examinee that the statements he makes during the examination will be treated as confidential?

Mr. INBAU. No. If you are checking with him with respect to some particular offense, robbery, murder, rape, what have you, he is not told that. One of the purposes frequently is not only to determine whether he is lying or telling the truth but if he is lying to interrogate him after the determination of lying has been made with a view to getting him to admit his guilt. That is subject to disclosure. But as regards the control questions the standard procedure is to keep that within the res of the examiner himself.

Mr. LINDBERG. As a practical matter, Congressman, when I suggested and told you that regarding the 400 burglaries and 50 robberies and the other plans this man had for felonies this material was reported in our report to the authority to whom we respond. This hap-

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pens to be the counsel, I mean the attorney for the city and for the police department. As regards the privileged communication, one may arise as the result of that fact. That is, the fact that we did respond to the attorney for the city.

Mr. MONAGAN. It is rather surprising and somewhat shocking to realize that this exists. First of all, I don't think that you should put a dollar tag on the question of whether or not you are going to report a crime, and secondly, it does seem to establish a sort of seal of a confessional or a new privileged relationship and puts the question of whether or not a report is made either upon the examiner, or if you identify him with his employer, upon the employer. Thank you, Mr. Chairman. I have no further questions.

Mr. Moss. Briefly, back to the perpetrator of 400 burglaries and 50 holdups.

Mr. LINDBERG. Robberies.

Mr. Moss. Robberies. A rather impressive record. Could this young man have been a psychotic who just sort of expanded upon fancy and had a field day for himself?

Mr. LINDBERG. We were concerned about that. I am not qualified as a psychiatrist to speak as to whether he is a psychotic or not. He has shown no indications of that and he did verify the locations of certain of these burglaries, and certain of the robberies, and also certain routes of armored cars which he planned to "tip over," as he used the phrase.

Mr. Moss. Isn't it true that there are a great many people who come forward every year and impose burdens on police departments by confessions of crimes never committed?

Mr. LINDBERG. That is correct.

Mr. Moss. And this could occur in the course of a polygraph examination?

Mr. LINDBERG. It certainly could.

Mr. Moss. The polygraph, and I think this is what we must look at, is essentially an instrument that undertakes to measure certain physiological responses of a human being. In that sense it is a scientific instrument. In that sense, it is an accurate instrument. It measures the blood pressure, it measures the respiration, and it gives you a reaction on a galvanometer of certain surface responses. It may have other measurements that it takes. In this sense it is no different than the electrocardiogram, or as you indicated Dr. Inbau, the stethoscope. So, there is no lie detector as an instrument; is that correct?

Mr. INBAU. Yes; there is no instrument that automatically does that.

Mr. Moss. The lie detector is a human being. One of the things he relies upon is an instrument giving him a series of graphs indicating physiological reactions of a human being. Mr. Backster, in your folder you apparently endorse the use of the galvanic skin meter: Is that correct?

Mr. BACKSTER. Yes, sir; that is correct.

Mr. Moss. And the electrical impulses that are transmitted to the instrument you feel are adequate in the hands of an operator with a high-school diploma, 6 weeks of training, and 2 years of supervised case experience to make a determination as to the guilt or innocence of another individual?

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Mr. BACKSTER. No, sir; I do not maintain that at all. In the first place, in applicant screening, and especially in the specific type screening, I feel it is not the capacity of the polygraph examiner to determine the guilt or innocence of any one. That is the capacity of our court system and review systems, and God Almighty, perhaps.

Mr. MOSS. Then we will say the honesty or dishonesty.

Mr. BACKSTER. Let us say the truth or falsity and that would be the extent of my particular findings in a specific case.

Mr. MOSS. A response to this one instrument is adequate to determine truth or falsity?

Mr. BACKSTER. No, sir; it is not.

Mr. MOSS. You didn't let me finish.

Mr. BACKSTER. I am sorry, sir.

Mr. MOSS. When used under the conditions I have stated, those in the hands of an operator or with a high school diploma, 6 weeks of training, and 2 years of supervised field work.

Mr. BACKSTER. I repeat, no, sir, it is not.

Mr. MOSS. All right, then, you add the other conditions.

Mr. BACKSTER. Sir; in the first place, the picture here is a schematic of galvanic skin response and there is always the breathing tracing at a minimum accompanying it. Unfortunately, in printing this, the word "schematic" that was printed on the chart itself was covered over with one of the overlays. But aside from that, with breathing and with galvanic skin response properly used, the result can be used only as an interview guide during a pre-employment exam and never to determine even deception, let alone guilt.

Mr. MOSS. All right, then, you are saying that the use of these two indices, that of respiration, and the surface reactions of the skin are adequate in the hands of an operator with the training previously mentioned?

Mr. BACKSTER. Adequate in what regard, sir?

Mr. MOSS. To develop the truthfulness of an individual.

Mr. BACKSTER. No, sir; they are not adequate to do that.

Mr. MOSS. What do you require in addition to this? How significant are the readings that you take from the polygraph in the determination made by the operator?

Mr. BACKSTER. In the determination made on a preemployment test that involves more than one issue in the same chart you are no longer running a direct question-type test in which you can determine the truthfulness or the falsity of the individual concerning that particular question, but you are then running a probing peak of tension test to which the subject may respond only to the one problem area that bothers him most. He may be bothered by other problem areas. In the long run in determining whether he was telling the truth or was attempting a deception by some other method, it may be found that he was attempting deception and showed nothing on the polygraph tracings.

Mr. MOSS. The basic determination goes back to the readings of the polygraph in the hands of the operator?

Mr. BACKSTER. Yes, sir, as a guide.

Mr. MOSS. That is what I am getting at, sir.

Mr. BACKSTER. As a guide in interrogation only, not as an indication.

Mr. MOSS. You have expanded on this guide. You fall back to the readings from the polygraph?

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Mr. BACKSTER. In making a report, sir?

Mr. Moss. In your statement.

Mr. BACKSTER. In any pre-employment report, not one report in 17 years of continuous usage of these indices, have I ever reported that an applicant was attempting deception.

Mr. Moss. I didn't ask you that.

Mr. BACKSTER. Or an applicant truthful either.

Mr. Moss. I didn't ask you that either.

Mr. BACKSTER. What is the question?

Mr. Moss. I asked you in your determination of the truthfulness of the person, these were significant. Then you went on to elaborate—I could have the reporter read it back—and you said that the "peaks," I believe is the term you used, become significant. That is the question I asked you.

Mr. BACKSTER. Yes.

Mr. Moss. In the determination of the operator.

Mr. BACKSTER. In what determination, sir? That is where we are at odds.

Mr. Moss. What determination is he there to make?

Mr. BACKSTER. He is not there to make a determination by this technique of truth or falsity.

Mr. Moss. What is he to determine?

Mr. BACKSTER. He is to use the chart indices as a guide in his interview procedure in the pursuit of the interview of that individual.

Mr. Moss. For what objective?

Mr. BACKSTER. With the objective in mind of finding out if the person does have some serious consideration that falls within bonding company realm that is bothering him concerning a particular background topic.

Mr. Moss. What are they concerned with?

Mr. BACKSTER. They are concerned with the topics you have outlined here on this sample report. Indebtedness to see if there are financial pressures that would cause a person to be tempted to steal. Marital tranquillity only to the point of whether there is complete tranquillity, or pursuit for alimony, support, garnishees of wages, because of this; but only to a degree that does not become ultrapersonal. The extent of gambling, if this is done to a promiscuous extent. Extensive drinking if it is done to excessive extent.

Mr. Moss. This is a psychiatric examination.

Mr. BACKSTER. So is every personal interview, then.

Mr. Moss. What does the psychiatrist attempt to do?

Mr. BACKSTER. I do not feel qualified to answer that.

Mr. Moss. Behavioral problems; isn't it?

Mr. BACKSTER. You are the psychiatrist.

Mr. Moss. I am not a psychiatrist.

Mr. BACKSTER. Did I understand you right that you had psychiatric training?

Mr. Moss. No, sir. What you overheard me comment this morning to a member of my staff——

Mr. BACKSTER. This was yesterday, sir.

Mr. Moss. Yesterday, that he had supplied me with a very dry bit of reading.

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Mr. BACKSTER. That was today.

Mr. Moss. Entitled, "The Manipulation of Human Behavior" by Biderman and Zimmer. I manfully waded through it. I qualified myself yesterday, I thought rather pointedly, by acknowledging that I was a layman both in law and medicine.

Mr. BACKSTER. That is what I heard. May I clarify one mistake that many people make in regard to preemployment type screening? It is the very one that I fear a number of committee members may have in mind. They may think that preemployment exams are for the purpose of determining truth or deception regarding any given target area.

Mr. Moss. Do you deal only in preemployment type examinations?

Mr. BACKSTER. No, sir.

Mr. Moss. Do you deal in examinations of the type where a determination of truthfulness is the end objective?

Mr. BACKSTER. Yes, sir; I certainly do.

Mr. Moss. All right, let us confine ourselves for the moment to that type of case.

Mr. BACKSTER. All right, sir. That would be a specific incident-type examination.

Mr. Moss. What use do you make of the instrument and what type of instrument do you utilize in those cases?

Mr. BACKSTER. During the type of examination where you are attempting to determine the truthfulness or the falsity of the individual regarding a given target that is being pursued during this type examination at a very minimum the three indices should be used without exception and preferably more than the three basic indices.

Mr. Moss. All three should be used?

Mr. BACKSTER. Yes, sir.

Mr. Moss. Blood pressure?

Mr. BACKSTER. Yes, and the breathing and the GSR.

Mr. Moss. And the breathing and skin response?

Mr. BACKSTER. Yes, sir.

Mr. Moss. Have you determined what other physiological problems of a person could produce similar responses to those which show up on these graphs, and would have a bearing on the operator's interpretation?

Mr. BACKSTER. Yes, sir; I have pursued that at great length.

Mr. Moss. Through what type of training?

Mr. BACKSTER. May I start in by stating that the very basis of the procedure that is being used is not based on allowing extraneous factors to distort the examination results to any degree of consistent fashion by the very nature of the intercomparisons and the number of intercomparisons that are used throughout the examination procedure.

Mr. Moss. You know, Mr. Backster, you remind me of a hearing I had last year where we were inquiring into television ratings, and audience measurement. We had instruments there and they were very important. They formed the basis of one system and under examination they were not important, and then they were important. They either have or have not a significance.

Mr. BACKSTER. Sir, in this case, I think it may be of importance because this is the same system that I am talking of that is used as a standard at the Fort Gordon school.

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Mr. Moss. I think it is most important and that is why I started my line of questions with you, because in the presence of this committee, you stated that you aided in establishing the system used by the Central Intelligence Agency.

Mr. BACKSTER. Yes, sir.

Mr. Moss. And you were, I believe, the adviser in the establishment of the system now used at Fort Gordon?

Mr. BACKSTER. That is right.

Mr. Moss. For the training of polygraph operators for the Federal Government?

Mr. BACKSTER. That is correct, sir.

Mr. Moss. So I am interested in your system to find out the role the polygraph plays.

Mr. BACKSTER. Sir, may I ask you a question? I have just several colored slides that would take a few seconds to project that could help you greatly in understanding this.

Mr. Moss. I think you could explain it, can't you?

Mr. BACKSTER. I will try to. It involves chart interpretation. Where you gentlemen yourself, within a few minutes, could interpret charts that are the product of the propert technique leading up to chart interpretation.

Mr. Moss. This is the thing that I find disturbing. It seems to me that when we start to take readings of physiological changes in anything as complex as a human being, it is inconceivable to me that within 6 months' time——

Mr. BACKSTER. Six weeks, sir.

Mr. Moss. Six weeks, I believe. Six months in deference to the others. That in 6 months a person with a minimum educational background which has been the concensus of the three gentlemen in one instance and the high school qualification which you accept as adequate, that these people can take, with any degree of reliability, and fall back upon these physiological responses, unless they are fully conversant with all of the things that could go wrong in that body, the differences between human beings, which could produce similar responses. Whether the person before you is one who has, we will say, been long under tension? Maybe he is not even aware of it. Whether it is a very relaxed person? Whether it is a person who has some serious illness undetected which could have an impact upon the physiological responses? I don't see how, lacking this basic training, a person is really competent to rely upon physiological changes and indication of those changes as having pertinency to their truthfulness in responding to questions put by the operator, again who has no particular training in the field of psychology.

Mr. BACKSTER. May I comment?

Mr. Moss. Yes, you can comment.

Mr. BACKSTER. Sir, I wish only for the opportunity to be able to convince you and the gentlemen with you that this can be done.

Mr. MEADER. Mr. Chairman, Mr. Backster referred to some slides. Do you have them here with you?

Mr. BACKSTER. Yes, sir, I do.

Mr. MEADER. Why don't we see them?

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Mr. Moss. I think we will. I am willing to be convinced.

Mr. BACKSTER. Yes, sir, I am willing to try.

Mr. LINDBERG. Might I suggest, Mr. Moss, while Mr. Backster is setting this up, that in the event his demonstration is not convincing to each and everyone of you, that we have been working closely, not only with Mr. John Reid for the past 20 years, but more recently with the biomedical staff of Northwestern University, with the same people who work with the psychiatrists with their problems, with the surgeons with their problems, and with the physiologists and these other people with their problems, trying to work on interdisciplinary approaches to solve the problems of each field. They have established to our satisfaction that we do use the same techniques, for example, in analyzing records; namely, the impression technique that the neurologists and these other people who are generally looked upon as being accomplished and accurate and definite and so forth. We use similar procedures.

Mr. Moss. Mr. Lindberg, you use similar procedures, but you must concede that you do not have similar training.

Mr. LINDBERG. That is correct.

Mr. Moss. Yet you are dealing with the same thing, the human being.

Mr. LINDBERG. Yes.

Mr. Moss. If you had a very recent thorough physical examination of your subject, and perhaps some psychological examination of the subject, then I think there might be a basis to move ahead with that person coming into your office and submitting to an examination, frequently under great duress. Because while we talk very easily of the voluntary nature of this, the fact that it becomes a requirement for employment brings in an element of compulsion. It may be economic forces that make the individual submit to something which otherwise in the true voluntary sense he would not submit to.

Mr. LINDBERG. Might I suggest, Mr. Moss, that it is the same compulsion that causes many also to take the written examination as to intelligence of the physical exam?

Mr. Moss. I realize that.

Mr. LINDBERG. The same compulsion and nothing in excess of that.

Mr. Moss. Here we are talking about a very new field.

Mr. LINDBERG. Yes.

Mr. Moss. Where we rely significantly upon the physiological reaction he has as an individual.

Mr. LINDBERG. Yes. But it is the type of reactions that are rather well known in medicine, for example. They have prevailed now for 50 or more years.

Mr. Moss. In the hands of a doctor I wouldn't have the serious questions. Well known in medicine but not well known in the hands of the average, rather deficiently trained operator.

Mr. LINDBERG. Might I suggest that the expert in the polygraph field is trained specifically in the art or science of the detection of deception and in that regard no psychiatrist, psychologist, doctor, or neurologist is better qualified?

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Mr. Moss. I wouldn't argue with you on that if that person also had the training which could inform him that the response I am getting might be an indication of deception or it might be an indication of some very basic physiological problem in that human machine.

Mr. LINDBERG. Frequently, if those problems evidence themselves in the polygraph records, we do consult with the people that you are concerned with. Over the years, we have built quite an impressive record of research.

Mr. Moss. Today we are using many exotic drugs and medications. The full impact of those upon the human body is at the moment not understood by the medical profession. We had to enact far more stringent testing requirements. You recall that we have had some rather shocking side effects of many of these drugs.

Mr. LINDBERG. That is correct.

Mr. Moss. It is suspected that many accidents occur on highways because people routinely use something which interferes with the normal function either of the mind or of the body.

Mr. LINDBERG. We have been consulted by people who are interested in studying the effects of those drugs. We are working in the biomedical area on that. They want our learning.

Mr. Moss. They want your learning but there is not still in this field the active participation of the qualified medical researcher, the qualified researcher in psychiatry, that I would like to see.

Mr. LINDBERG. Yes, there is.

Mr. Moss. You say yes, there is. Maybe there is academically.

Mr. LINDBERG. We are the practitioners and the researchers as well. But there are other people in the background.

Mr. Moss. What is your qualification in medicine?

Mr. LINDBERG. I am a practitioner of polygraph examinations.

Mr. Moss. Of law. What is your background in physiology?

Mr. LINDBERG. Fairly substantially. I don't work with it every day. I have had practically every physiological course.

Mr. Moss. How closely do you follow the reports of new drugs and medications?

Mr. LINDBERG. We receive a significant amount of literature in the field.

Mr. Moss. One of the great problems today is even attempting to keep up with the literature when encountered in daily practice.

Mr. LINDBERG. That is why so many of them are so uninformed in the area of polygraph because they don't have the opportunity.

Mr. BACKSTER. May Ihave one statement, please?

Mr. Moss. I am going to have some questions for you, too.

Mr. REUSS. Mr. Chairman, I would like to know before the demonstration starts just what is being demonstrated here and how long it is going to take.

Mr. Moss. He said it would be very brief.

Mr. BACKSTER. Very brief; yes, sir.

Mr. Moss. He would explain as he goes along.

(At this point, the showing of slides began with slide No. 2201.)

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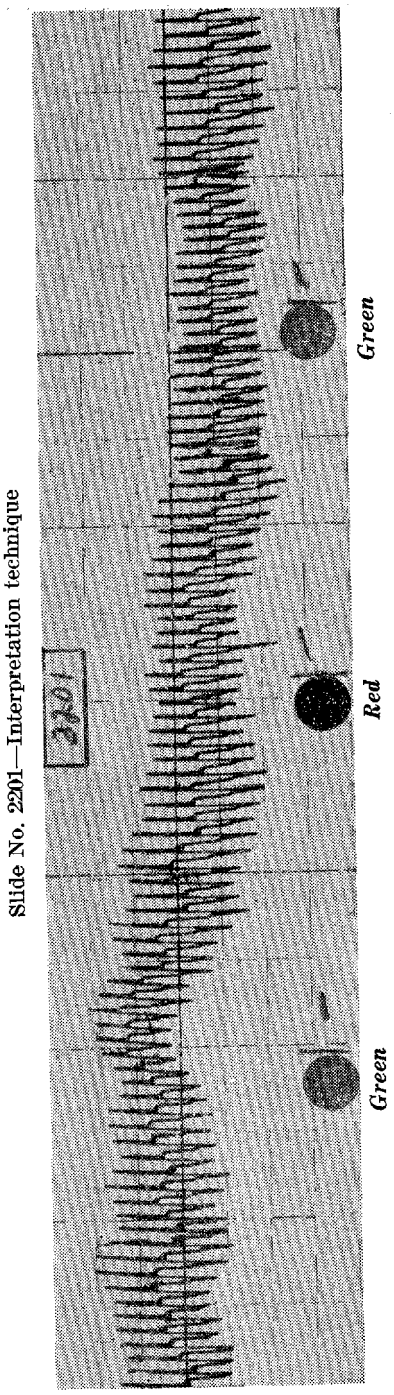

Slide No. 2201—Interpretation technique

31-647—64——6

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Mr. BACKSTER. Gentlemen, in this particular chart, we have represented by color code, two distinct and different types of questions used in an examination. This is really meant to be green, my color photography is not so good. We have, with color code, indicated by red where a strong, relevant question was asked which was designed to cause a response and the guilt of the individual was later confirmed. We have asked at each of these two locations, where the green color code is, a question designed to stimulate the innocent person, later verified. He should not respond, in this particular case to both of these questions.

So, we have the green color code as an indication that a question designed to cause a person that is innocent to respond regarding the target issue and the red designed to produce a response within the individual that is later confirmed guilty. The question formulation must be proper. It must be ideal in order to set the charts up in this manner. Here, also, is the basis applying the color code to the John Reid system. They have a control question which, in this particular case, we call a probable lie question. Something about the earlier portion of the individual's life that we feel steers clear of the actual area and avoids the time element of the particular current incident that is involved.

Here, we have each beat of the pulse all the way through from the beginning to the end of the chart slide which represents about 80 seconds of time. This 80 seconds of time embraces three questions. Here, by a series of lines going up and down we have represented a relative change in blood pressure. This is a relative change that is indicated and recorded but not measurable as such.

As the series of lines stop going up and down as you see through certain areas of that chart, we then have no emotional impact or no physiological impact regardless of its origin.

In making the intercomparison here, we will look to see if the red zone question which is a relevant question produces what appears to be the major response in the overall chart that we see here. We will then look to the opposite category question to see if there is a corresponding lack of response there.

In this system there must be a presence of his response in one of the two categories of questions and lack of response in the other and not a lack of response to both to any degree whatsoever.

Here you see, sir, and I could ask you where you see an irregularity. By what question do you see the series of lines go up and would you be able to state that, sir?

Mr. MOSS. Let me ask you: Is this a continuous reading without interruption?

Mr. BACKSTER. Yes, it is, sir.

Mr. MOSS. Starting over here at the first green?

Mr. BACKSTER. Yes, sir.

Mr. MOSS. Continuing to the last green?

Mr. BACKSTER. Continuing right on through.

Mr. MOSS. During this time three questions were asked?

Mr. BACKSTER. Yes, sir.

Mr. MOSS. Were these the beginning three questions?

Mr. BACKSTER. No, sir. In this particular case, there were some lead-in questions.

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Mr. Moss. Are they on this chart?

Mr. BACKSTER. No; they are not meant to be on a spot analysis chart. We are training our people to look at one relevant question, to make a separate, independent rating at that time. There are two other tracings that could be read. They are coded. They are mixed in other verified truth and innocent cases and he is given them back without realizing they are not related to this case.

Mr. Moss. I can tell you what I can interpret from the chart, that the subject was relaxing gradually as you went along.

Mr. BACKSTER. Yes, sir; that would be a good observation. What question was he tense on before he started to relax?

Mr. Moss. I don't know. It is gradual progress down so it is relaxing.

Mr. BACKSTER. The peak is at this point and the relaxation beyond, which constitutes the relief. This is the question that worried the individual. In fact, he was even relieved when we got on to the relevant question, instead of disturbed. So, here we have a lack of response on the red zone question designed to stimulate the guilty and we have a response on the green zone question designed to stimulate the innocent. In this case, we would give a determination of truthfulness at this isolated location.

In 1 chart, we have 6 of these locations; in 2 charts, 12; 3 charts, 18 separate individual evaluations in order to have an opportunity to do exactly this. I will put one more chart on.

Mr. Moss. Let me ask you this while you have that chart on.

Mr. BACKSTER. I am sorry, sir. I will see if I can back this slide up.

Mr. Moss. From a medical standpoint, could you take a reading of a person and get that without asking any questions?

Mr. BACKSTER. You would not get the intercomparison of concern or lack of concern.

Mr. Moss. Are you certain of that?

Mr. BACKSTER. Yes, sir; I am certain of that, sir. A distortion because of medical reasons is a distortion throughout but we know of no medical ailments that will isolate themselves to one color category of questions and not the other.

Mr. MEADER. This line indicates only the pulse rate?

Mr. BACKSTER. You mean the tracing?

Mr. MEADER. Yes.

Mr. BACKSTER. Yes, sir. This indicates each and every beat of the pulse and every relevant change in blood pressure of the individual but does not measure the blood pressure. It does measure the pulse rate per unit of time. We have a standard or constant as far as time is concerned.

Mr. REUSS. Let us keep this on here, because I don't begin to understand this at all. What do you mean by questions that make the innocent gurgle or whatever it does?

Mr. BACKSTER. They don't really gurgle. These are questions that involve earlier-in-life situations. If the man is not telling the truth on the relevant issue, because that is the one that can hurt him immediately as far as his self-preservation is concerned or his well-being; if he is not telling the truth to the relevant question the earlier-in-life questions become insignificant because they are then remote compared to his immediate problems. But if he is being truthful to the relevant issue question, then he has no concern other than a

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natural stigma which used to be a problem before we had what is equivalent to our green zone question as a safety device, introduced by Mr. John Reid. Before we had this, we sometimes got artificial stigma to the relevant question even to an individual later identified as innocent.

In this present-day technique, the content of the earlier-in-life question is adequate to solicit the concern of the individual and thereby produce response and the elimination of any response that might have occurred on the relevant questions.

Mr. Moss. What was the type of question on that green line?

Mr. BACKSTER. That would be such as "during the first 18 years of your life, do you remember ever doing something to hurt somebody who trusted you?"

Mr. LINDBERG. It is a control question.

Mr. Moss. Suppose you didn't recall that but you recalled something that was rather interesting or stimulating, would you get the same response?

Mr. BACKSTER. We suspect that they will recall something and respond to it if they are not concerned with the relevant issue.

Mr. Moss. How do you know whether the response—and this is a physiological response—is because it is relevant or because in the quick recollection it is something that sort of gives them a boost?

Mr. BACKSTER. Either way, we are happy it happens. We get it consistently. That is the main consideration.

Mr. REUSS. Just take the case you have put, where your first green question on the left-hand third of the chart is, as you say: "During your first 18 years, did you ever do anything to hurt someone who trusted you?" I might say that everybody in his first 18 years obviously does do something to hurt somebody that trusted him.

Mr. BACKSTER. We count on this; yes, sir.

Mr. REUSS. Then you get a little upward squiggle of the needle at that point, and are you thus inferring that the fellow must be leveling with you because he gets a little perturbation because, as you know, he must have done something to hurt somebody who loved him?

Mr. BACKSTER. Sir, we expected him to respond to that particular question if he were not wrong on the relevant question. His psychological perception set if he were wrong on the target issue, if he were later verified guilty, would be aimed toward that which could hurt him most and he would go right by the first and second green zones showing no significant response. This is a verified principle and validated.

Mr. REUSS. Where did you get this great truth from?

Mr. BACKSTER. Mr. John Reid is the one who got the initial great truth regarding this, and I am very happy for it because it was the first breakthrough in lie detection for years.

Mr. REUSS. You say Mr. Reid got it. What is the psychological and philosophical basis of what I take it is the assertion you are currently making that a human being won't flutter at all on a fairly innocent question if he is already to flutter on a big and important question.

Mr. BACKSTER. Sir, we have no fluttering as one of the types of reaction.

Mr. REUSS. I don't mean physically fluttering. I mean causing the needle to wiggle by his blood pressure.

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Mr. BACKSTER. The needle does not in this case wiggle too much differently. The blood pressure goes up forming a rise in the base line and the top line.

Mr. REUSS. That is what I mean by the needle wiggling. Where did you evolve the observation about the human mechanism which you have just described which I will try to paraphrase by the following black-letter statement: that human beings get their blood pressure up when asked a question of relatively innocent past conduct but don't get it up when they are lying in wait for a question of criminal or guilty conduct? I think that is what you are saying?

Mr. BACKSTER. When they are right or wrong on the relevant issue.

Mr. REUSS. Where did you determine all this, that this is what happens to a human being's blood pressure? How do you determine that at a particular point, for example, the subject didn't stir in his chair or some silly thought entered his mind which caused this to happen?

Mr. BACKSTER. Sir, in all probability, a silly thought did enter his mind that caused it to happen because of the earlier-in-life situation. The fact that it was not a wiggle or movement is evident by the chart itself because there would be a broken pattern that is quickly recognizable as a movement in most cases.

Mr. REUSS. I thought what you were saying is that if a guy is a bad guy and guilty in the red sector——

Mr. BACKSTER. Sir, I didn't use that term.

Mr. REUSS (continuing). That he won't have any blood pressure changes in the first green sector.

Mr. BACKSTER. That is correct, sir. He should not have.

Mr. REUSS. This is a major assertion about human beings.

Mr. BACKSTER. Yes, sir.

Mr. REUSS. I hope you can document this rather fully.

Mr. BACKSTER. Yes, sir; I can.

Mr. MOSS. Could he have had a thought there that had nothing to do with his earlier life? Maybe at that point he might have thought to himself, "This is sort of a ridiculous procedure to be subjecting myself to." Could that have caused him to pop up and down?

Mr. BACKSTER. Sir, if he would be kind enough to think that each time we asked that kind of question it would serve the same purpose.

Mr. MOSS. What purpose would it show?

Mr. BACKSTER. It would show that were his psychological set. This psychological set principle is in any basic psychology book. It is broad enough to interpret and listen to and perceive and distribute the perception of the stimuli around him and not be tuned in and localized to something that he is afraid of as related to his well-being, he will hear and perceive and react in varying degrees to various extraneous stimuli. In fact, the very reason that this theory initially was explored was because I was showing a great deal more anxiety than many of my subjects to distractions or disturbances or interruptions in the interrogation room.

I traced back to find out by verified charts only which category seemed to be mostly disturbed and right down the line it ended up being the individuals who were verified truthful or innocent on the target offense that were showing disturbance where their perception was open enough.

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Mr. Moss. Verified truthful by whom and what method?

Mr. BACKSTER. The only way or at least one of the few ways of verifying the polygraph case result is by the confession of the man himself where he gives enough identifying detail where it could not be a confession by a psychopathic.

Mr. Moss. If he is a successful liar, you don't know it.

Mr. BACKSTER. If you are so successful a liar that you don't realize you are lying you will not show up on the polygraph.

Mr. Moss. How do you know I am a successful liar that knows I am lying or doesn't?

Mr. BACKSTER. His reputation before they ever get to us in our polygraph testing situation—this is usually pinpointed.

Mr. Moss. How do you know the successful liar who knows he is lying is going to react differently than the successful liar who doesn't?

Mr. BACKSTER. We have had no successful liar who got away without showing reaction.

Mr. Moss. You have no chronic liars. You have no people who are very amoral and have no standards and lie at the drop of the hat and have no guilt complex?

Mr. BACKSTER. I would classify this as a habitual liar and not a psychopathic liar.

Mr. Moss. Habitual or chronic.

Mr. MEADER. Have you ever given a lie detector test to Drew Pearson?

Mr. BACKSTER. I don't know if he has even been tested, sir. I can again only state that during my nearly 17 years of giving examinations I have been confronted with only one or two in that entire period of time that were strongly suspected of being psychopathic liars.

Mr. Moss. Let me ask you this: In your 17 years of giving tests, have the results of your examinations been independently evaluated by outside research?

Mr. BACKSTER. The results of the examination in order to be considered verified or unverified or semiverified have had to meet certain standards.

Mr. Moss. Whose standards?

Mr. BACKSTER. The standards set up, I would certainly think, by the polygraph profession, in general.

Mr. Moss. I am talking of a postaudit of your results.

Mr. BACKSTER. Yes.

Mr. Moss. Not your in-shop research.

Mr. BACKSTER. That is right.

Mr. Moss. Outside, independent evaluation of this 17 years of records?

Mr. BACKSTER. Sir, I would be awfully happy if some facility would be set up to do exactly that. It is expensive.

Mr. Moss. Isn't it essential that sort of evaluation of these results be made if we are to regard them as having reasonable reliability?

Mr. BACKSTER. No, sir; I don't feel it is necessary under these circumstances.

Mr. Moss. You think your own evaluation of your work——

Mr. BACKSTER. I don't believe one should do the final evaluation of his own work. I have had many others evaluate my work besides myself. Users in the field.

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Mr. Moss. You have had users, you have had clients, who have accepted your results?

Mr. BACKSTER. Yes, sir.

Mr. Moss. These are not polygraph specialists, necessarily?

Mr. BACKSTER. Not necessarily; no, sir.

Mr. Moss. It could be a corporation?

Mr. BACKSTER. Yes, sir. It may be a personnel officer.

Mr. Moss. What kind of an evaluation can a personnel officer make as to the techniques employed and the results obtained?

Mr. BACKSTER. The employment of techniques is our job. The interpretation of our results to many——

Mr. Moss. How many of these people in the 17 years that you have said after careful screening, "This is a person who is a desirable employee," have subsequently absconded with something?

Mr. BACKSTER. I believe that there is no way I will ever know, sir.

Mr. Moss. That would be very significant.

Mr. BACKSTER. You are now speaking of preemployment screening?

Mr. Moss. Yes.

Mr. BACKSTER. That would be very significant. This preemployment screening is an entirely different category.

Mr. Moss. No, it isn't. It is the use of this machine in determining certain human behavior or the probability of certain inherent behavior patterns in human beings. If we took all of your results, you have cleared all these people, you have said to the employer, "They appear to be A–1 material for employment by you," what followup would indicate whether your judgment was good, bad, or indifferent?

Mr. BACKSTER. Certain of our accounts using the service, for example, one is Davidson Transfer & Storage, who keeps excellent statistics, has done so. Here and in the Baltimore and New York area they have kept good statistics on the results and correlation of the preemployment tests as compared with the behavior of the driver after he is on the job. They have given talks really praising in great degree the preemployment system as a means of hiring.

Mr. Moss. You don't know how many of these people have committed crimes and absconded with something?

Mr. LINDBERG. Might I answer that, Mr. Moss, because I have some statistics, not direct ones. One company who I would prefer not to name, but I will if necessary.

Mr. Moss. I think in the interest of the committee's being able to evaluate with reasonable accuracy the testimony of the witnesses, if we are going to use statistics, the committee will want to have an opportunity to verify them. I don't want and I know that my colleagues join me in this, to undertake an evaluation of a subject as important as this without being able to validate that statistical information we have.

Mr. MEADER. Is it necessary to make the name of the company public? Couldn't that be furnished to the committee?

Mr. Moss. That can be furnished to the committee.

Mr. LINDBERG. I will be glad to furnish it. The particular company is a large Chicago retail house. I don't have these emphatic statistics, only the word over the telephone of the security director who told me he would be willing to give me the specific statistics if I came over there. He indicates that on people who have undertaken polygraph examinations before being employed regarding their prior honesty as a prediction of their future performance with regard to honesty that the

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margin of established error, established by the fact that the man subsequently did steal after he had been cleared through our laboratory, was approximately 1 or 2 percent, as opposed to the nonpolygraph section which runs upward in the area of 10 to 20 percent.

I don't have the direct figure. But it is at least 10 times higher than among people who were not——

Mr. Moss. Mr. Lindberg, wouldn't it be true that there might be some significant dropoff if an employer merely said that everyone who applies here will have to take a polygraph test?

Mr. LINDBERG. Most definitely.

Mr. Moss. You might even have a dropoff if you said that everyone who applies for employment here will have to be fingerprinted and get a certificate from the local police chief that they have no prior record.

Mr. LINDBERG. Most definitely.

Mr. Moss. So, you have certain psychological factors that come into play and to thoroughly validate this we would have to have some statistical data on these other categories and correlate it.

Mr. LINDBERG. In this particular company I mentioned, those other safeguards are not present. They rely almost exclusively on the use of the polygraph for that purpose.

Mr. Moss. We are going to have to suspend; there is a quorum call, and it is now quarter past 12. The committee will stand in recess until 2 this afternoon.

(Whereupon, at 12:15 p.m., the subcommittee recessed, to reconvene at 2 p.m. the same day.)

AFTERNOON SESSION

(The subcommittee reconvened at 2:30 p.m., Representative John E. Moss (chairman of the subcommittee) presiding.)

FURTHER TESTIMONY OF FRED E. INBAU, NORTHWESTERN UNIVERSITY SCHOOL OF LAW; CLEVE BACKSTER, BACKSTER SCHOOL OF LIE DETECTION, NEW YORK; JOHN E. REID, JOHN E. REID & ASSOCIATES, CHICAGO, ILL.; AND GEORGE LINDBERG, JOHN E. REID & ASSOCIATES, CHICAGO, ILL.

Mr. Moss. The subcommittee will be in order.

Before we continue with Mr. Backster's presentation, I would like to dismiss the witnesses from the Department of Defense, because of problems in the House which in all probability will require a number of quorum calls this afternoon. It does not appear as though we have reasonable expectations of completing in time to hear from you. I ask that you be here tomorrow morning at 10 o'clock. Before we resume our discussion of the slide, I would like to insert in the record a copy of the slide which has been discussed in the presentation by Mr. Backster. It is identified as "No. 2201." (See p. 77.) When the staff reproduces this, because of our inability to reproduce color, I would instruct that the first dot be keyed as green and the second red and the third as green.

Mr. BACKSTER. Sir, we merely use a small g and a small r.

Mr. Moss. Now, you may resume your presentation, Mr. Backster.

This slide is identified as No. 3305 and a copy of this will also be inserted in the record at this point.

(New slide No. 3305 follows:)

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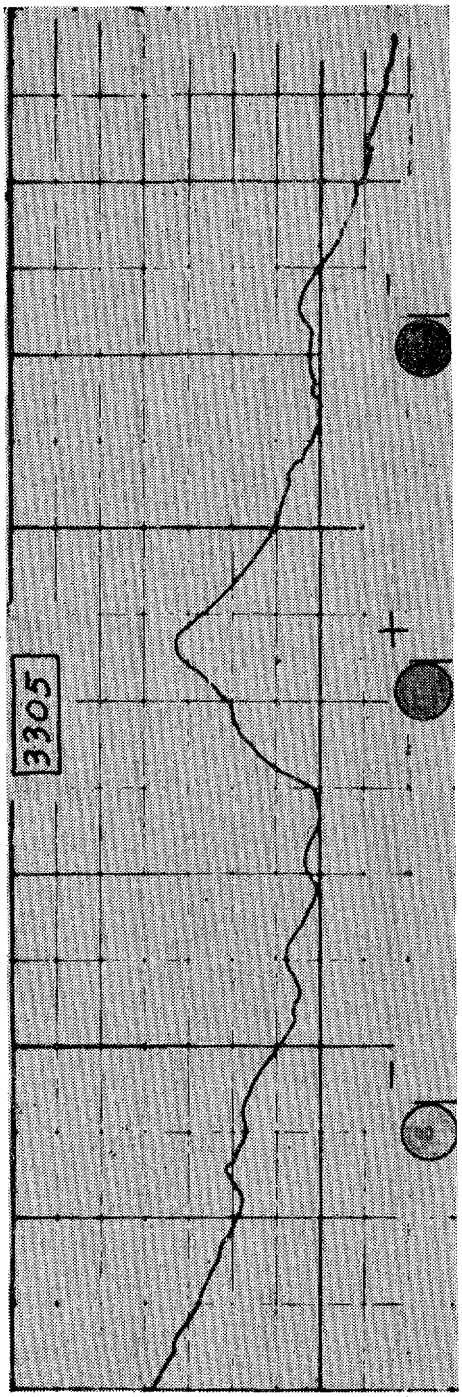

Slide No. 3305—Interpretation technique

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Mr. BACKSTER. First I would like to correct any false impression that I might have given in this morning's session that the ease with which you can interpret a finished chart, one that has been led up to properly, means that the study of polygraph is, thereby, drastically shortened to only a few days instead of the 6-week course we have responsibility of. The main efforts leading up to the eliciting of a chart such as this are really what requires such a study as far as the polygraph is concerned. This involves the ability of the examiner to progress through four of the five major steps in order that he would get a sound fifth step, or readable charts. If he does not know how to interrogate, to obtain his basic case information and evaluate it, and if he does not know how to select the proper target to pursue, if he does not properly word the question that involves his target, and if he does not put this question in a sound polygraph procedure, any one of these weak links in the chain of events can ruin his chances of having an ideal chart such as this in the last of these steps.

Once we have arrived at the final step it is somewhat like the painter who has been skillful in painting a portrait of somebody that now looks like somebody that they are painting. It was the skill of the painter through all the steps that he needed to go through that caused the end to be easily recognized as you may recognize it here. Here we have the general color code meaning that a question was asked here to stimulate the truthful individual or the later verified innocent individual, and here a question was asked that was a strong relevant question to cause stimulation within the person who was later verified as guilty of the offense or he was attempting deception regarding the target issue. Did you yourself steal most or all of that $5,000, whatever it happened to be, tying it in properly timewise? Over here we have a new entry on the scene which is the third of the three basic components in the zone comparison test. In the trizone comparison test, we have basically three separate blocks approximately 20 seconds duration. Each time block represents a zone during that particular zone the person is under the effect of one of three basic natures of questions. Here the question about earlier in life that would stimulate the person who had nothing more important on his mind particularly as related to the relevant question. Here a strong relevant question was asked that should elicit his concern if he is guilty as later verified. Here we have a question that is asked in which we accomplish the purpose of evaluating the degree of trust that the subject has in the polygraph examiner. This question is a symptomatic question. Actually there are two of them asked during each examination chart.

This is what I would term to be the last important contribution that rounds out the overall scope of our polygraph examination problems. With the considerations of each or all of these three basic types of questions a situation in which we can detect that something is wrong and needs remedying. We can then suggest to ourselves through a correctional table exactly what should be done to remedy our bad characteristics, if they are not readable.

In this particular case you will notice that GSR changes upon giving answer to the relevant question. We must remember that the galvanic skin response is over to the left approximately 5 seconds from the marking stimuli in order to miss the other two pens on the chart.

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As this galvanic skin response pen swings up and down it misses the two short pens recording the breathing and the cardio. So we must look to the left for 5 seconds which is from mark to mark in order to see where the action is really taking place. Here recognizing the content of the question the person went up in a preliminary arousal and topped it at the point of answer at this point. He showed an arousal and relief thereafter relieving down through and at the time that this symptomatic question was asked which was stated, Are you completely convinced that I will not ask you a question on this test that has not already been reviewed. That would be the one at the beginning? Here would be the one, asked toward the end, Is there something else you are afraid I will ask you a question about even though I promised you I will not?

If the person does not have confidence in the polygraph examiner and is hiding something from him as an outside issue that is very explosive, he will show to this question and will not show to either these as he should, one or the other. We have eight combinations of what could occur, showing stimulation to the innocent questions only, to the guilty questions one or both of them, or to one or both of the symptomatic question zone. Each of these has a special meaning and each combination tells us exactly what we must do about it in order to correct the situation. In this particular case, because we have a presence of response on the red and lack of response on the green generally speaking we can make a determination of deception at this particular spot or location.

Mr. Moss. How?

Mr. Backster. We have designed our two basic types of questions so that the red zone question which is the relevant question is designed to stimulate the guilty.

Mr. Moss. Who designs the question?

Mr. Backster. The polygraph examiner in the third step that I mentioned to you of the five important steps.

Mr. Moss. These questions are designed to in themselves affect some stimulus to the subject, is that correct?

Mr. Backster. Did you yourself do such and such? Very direct?

Mr. Moss. That is not what I asked you. I asked you if they are designed to generate some physiological responses?

Mr. Backster. They are designed to produce emotional response, sir.

Mr. Moss. Will you tell me how an emotional response differs from a physiological response if you are going to determine its occurrence by taking the blood pressure, respiration, and skin stimulus effects.

Mr. Backster. There is actually a chain of events where the emotional response is the first to occur causing physiological response. But we cannot identify that emotion involved by inspecting the physiological response.

Mr. Moss. You are reading the chart. Is it a reading of a physiological response?

Mr. Backster. This is a physiological response.

Mr. Moss. That is what I asked you about.

Mr. Backster. That is correct.

Mr. Moss. We have covered a lot of ground and gotten nowhere.

Mr. Backster. Will you repeat the question?

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Mr. Moss. It is already in the record. Is it necessary to repeat it, or do you recall it?

Mr. BACKSTER. I believe your question, sir, was, Is the question designed to produce physiological response?

Mr. Moss. Yes.

Mr. BACKSTER. My answer is that the question is designed to produce that which ends up being physiological response; yes, sir.

Mr. Moss. Isn't it designed to produce that which is defined as a physiological response?

Mr. BACKSTER. Sir, we are not trying to isolate or cause a physiological change in the body. We are trying to do with a certain emotion, the emotion of being afraid or having fear of apprehension. This is what we aim everything toward and not toward a beating of the pulse faster or broader or any other phenomena such as that.

Mr. Moss. If you fail to bring about some effect upon the physiology, then, we are not able to make any measurement.

Mr. BACKSTER. If we are not successful in doing that we are not able to make a measurement.

Mr. Moss. Whether or not you design it, you achieve, you hope, a physiological response.

Mr. BACKSTER. Yes, sir.

Mr. Moss. If it makes it more comfortable for you to respond by regarding it as emotional rather than physiological you may do so.

Mr. BACKSTER. Yes, sir; it does make me more comfortable.

Mr. Moss. These questions are developed by the operator?

Mr. BACKSTER. By the examiner, sir.

Mr. Moss. The examiner. Is he different than the operator?

Mr. BACKSTER. He certainly is.

Mr. Moss. Always?

Mr. BACKSTER. Yes; in our language he is.

Mr. Moss. The language in context with our discussions today, the person who has been trained, is there a difference in the training period of the two?

Mr. BACKSTER. Sir, there has been one suggestion that this be the case.

Mr. Moss. That is not what I asked you. I asked you if there is a difference?

Mr. BACKSTER. A generally accepted different?

Mr. Moss. No; in your own personal experience in the type of schooling that you provide and that you have recommended here today, is there a difference?

Mr. BACKSTER. Yes, sir; because when a person says operator it costs him 10 cents each time at our school.

Mr. Moss. Are we in a matter of personal pride or are we in a matter of semantics?

Mr. BACKSTER. We are in a matter of standard phraseology used in a highly refined field.

Mr. Moss. So far this inquiry has been concerned with the polygraph operator. I think it has been generally discussed in that context here, and the 6 weeks training, 2 years supervised field service. Now, are we talking in that context about an operator or an examiner?

Mr. BACKSTER. Sir, the proper phrase is examiner.

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Mr. Moss. You will be most patient and indulgent with the Chair if he is not familiar with the terminology of the—you are making me self-conscious, I have difficulty now in selecting the appropriate word—industry or profession or what do we call it?

Mr. BACKSTER. In my profession, sir.

Mr. Moss. I would hope so, too. What are you talking about? Who makes up the question?

Mr. BACKSTER. The polygraph examiner.

Mr. Moss. Is that the person who has been trained for 6 weeks, and given 2 years of fieldwork under supervision?

Mr. BACKSTER. Yes, sir.

Mr. Moss. Does he ever operate a polygraph?

Mr. BACKSTER. We don't like that phraseology, sir.

Mr. Moss. Does he ever operate a polygraph?

Mr. BACKSTER. In that terminology, no; he does not.

Mr. Moss. Mr. Backster, I do not care in the slightest what you like or dislike. I merely want the reflection on this record of as many facts as it is possible to elicit. I think you would be far more helpful to the committee if you avoided being cute or technical.

Mr. BACKSTER. Sir, I am not.

Mr. Moss. And within a sense of reasonable latitude here responded. You know full well what I am discussing.

Mr. BACKSTER. Sir, I will agree with any phraseology you want to call it.

Mr. Moss. I don't ask your concurrence in my terms. I merely ask that you be patient with me and respond when you know what I am talking about.

Mr. BACKSTER. I will do that.

Mr. Moss. Please do so, then. Does the examiner ever operate a machine?

Mr. BACKSTER. Yes, sir.

Mr. Moss. Now, this examiner who has had this training prepares the questions which are designed to bring forth differing emotional or physiological responses, is that correct?

Mr. BACKSTER. That is correct.

Mr. Moss. What kind of a course does he have that informs him as to the type of questions which will bring forth these differing responses?

Mr. BACKSTER. This is part of his training in the instruction period.

Mr. Moss. I assumed that. I asked you what type of training does he have?

Mr. BACKSTER. As a background, sir. I don't understand your question, sir.

Mr. Moss. All right, we take a man with a high school diploma, and he is going to be trained for 6 weeks. Where background stops in that training and where it might begin I am not going to judge. But in that 6 weeks what type of training does he receive which fits him to draft the questions designed to bring forth the varying responses reflected on that graph?

Mr. BACKSTER. The breakdown of the course, sir. One section is the question formulation. Actually we are getting into semantics during the question formulation instruction.

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Mr. Moss. The first one here is supposed to recall something years passed.

Mr. BACKSTER. Earlier in life; yes, sir.

Mr. Moss. The next one is to bear directly upon his guilt or his innocence.

Mr. BACKSTER. Yes, sir.

Mr. Moss. The term guilt——

Mr. BACKSTER. His later verified guilt.

Mr. Moss. You are asking him the question now and the chart is made now, and you are telling me this is on his later verified guilt. When is the chart made?

Mr. BACKSTER. Sir, I am talking in regard to his deception to the target issue.

Mr. Moss. I can only hope that the course is far clearer than the responses have been. Mr. Reuss, do you think you might bring some order out of the chaos I have gotten myself into?

Mr. REUSS. I would like to ask one question. Look, whether he is an operator, an examiner, or whoever it is, there is just one human being there who asks the questions and operates the machine, is there not?

Mr. BACKSTER. Yes; there is only one.

Mr. REUSS. In addition to that one fellow called a subject.

Mr. BACKSTER. Yes, sir.

Mr. REUSS. He is the fellow who is examined, so there is a total of two, is that correct?

Mr. BACKSTER. That is correct, sir.

Mr. REUSS. I think this unravels the mystery of the operator and the examiner. The same fellow.

Mr. Moss. Yes; I had elicited that, Mr. Reuss, but I have not yet been able to learn what is it they are given in the way of training in this 6 weeks to qualify them to draft questions to bring forth from anything as complex as a human being the specific types of reactions.

Mr. BACKSTER. Sir, I have this enumerated, in fact, the entire course breakdown, in the material given to you this morning, if I may refer to it.

Mr. Moss. Mr. Backster, if I had time to take the correspondence I would not have to call you in. That is why I had hoped you would be able to cut through some of the material that you have presented to me and clarify it.

Mr. BACKSTER. Sir, you have me at an unfair advantage. I can't answer that.

Mr. Moss. You mean——

Mr. BACKSTER. You would consider it impertinent.

Mr. Moss. I what?

Mr. BACKSTER. You would consider my answer impertinent and I would not want that.

Mr. Moss. I would prefer you let me decide what is impertinent. If you are answering in good faith I will even tolerate impertinence.

Mr. BACKSTER. I am answering in good faith.

Mr. Moss. Let us have it.

Mr. BACKSTER. Sir, the answer is: as a student I would find it much easier to deal with you than as a Congressman.

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Mr. Moss. I would hope as a student I would find you much clearer than I have as a Congressman because if I did not, I would indeed fail the course. Let us take a look at the training curriculum. I think this is most important to try to get on this record, in some reasonably concise form, the nature of some of your instruction, again in view of the fact that yours is the more relevant procedure because it is the one most commonly employed in the training of those who operate polygraphs for the Federal Government. I can—at the risk of prejudging—say that I have not been reinforced in my seeking assurance that the best technique has been employed. I assume that this is section D, polygraph question formulation:

> This course section strongly emphasizes scientific selecting of the strongest possible examination target through evaluation of intensity, adequacy of available information, and distinctness of issue. Also emphasized are strict rules governing the formulation of the relevant questions covering the target selected. These rules involve singleness of issue, clarity of issue and literally touch upon the science of semantics. (See exhibit 6, p. 184.)

In 6 weeks.

Mr. BACKSTER. Yes, sir.

Mr. Moss. The science of semantics. There are many who have regarded it as a lifetime study. "Adequate formulation of questions for reliable stimulation of the innocent is emphasized." Are the questions always made up ahead of time before a subject is hooked up to a polygraph?

Mr. BACKSTER. Most of the time, sir, they are made up with the subject before he is hooked up to the polygraph so that he may have the choice of taking or refusing the test.

Mr. Moss. Is there during the course of the presentation of these questions a conscious or unconscious evaluation by the operator of the probable guilt or innocence of the subject?

Mr. BACKSTER. I can speak for myself, sir, on that.

Mr. Moss. In your course, is care taken to insure that this does or does not happen?

Mr. BACKSTER. We take great care to insure that this does not happen, sir.

Mr. Moss. Because it is brought to my mind rather forcefully when it here refers to the stimulation of the innocent. "Adequate formulation of questions for reliable stimulation of the innocent is emphasized," which would indicate to me some prejudgement in the formulation of questions. If I am wrong I would like to have the record reflect the facts.

Mr. BACKSTER. Sir, there is prejudgment and you are not really wrong. But it is prejudgment by question purpose if that is the case it is implied by the relevant question also. Each eventuality is projected.

Mr. Moss. In the 6 weeks, in 12 hours, we are going to get the science of the semantics.

Mr. BACKSTER. That is touched upon.

Mr. Moss. Then there is an evaluation made before the questions are in their final form.

Mr. BACKSTER. Evaluation of the questions; yes, sir.

Mr. Moss. No; of the subject.

Mr. BACKSTER. No, sir. As far as his guilt or innocence is concerned, or his truth or deception.

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Mr. Moss. Mr. Reporter, would you read back the answer to the question I asked over here?

(The question was read by the reporter.)

Mr. Moss. I asked the question because I find myself somewhat confused by your two answers. I asked very clearly if there was an evaluation and you said, yes, that I was not wrong. Then I repeated essentially the same question here in different context and received a different answer which was that I was wrong. Now, which is it?

Mr. BACKSTER. Sir, during the pretest procedure and the formulation of the questions that are to be used during the examination, I had at all costs attempted to avoid any premature opinion as to the truthfulness or deception of the person in regard to the target issue. But I do evaluate the questions and apply rules to each of the questions to see if they will stand up against each eventuality, that the person be telling the truth and the person not be telling the truth to the target issue.

Mr. Moss. Now, is all of this taught in the 12-hour course?

Mr. BACKSTER. Yes; it is in each note pack, outlined step by step where they check the list.

Mr. Moss. Do you realize, Mr. Backster, that you have in a 12-hour period of instruction undertaken to cover a very extensive field. You are going to teach them to formulate questions designed to bring forth a specific type of stimulation of the subject. I would imagine it would take a rather skilled psychiatrist, really, or it would take some instruction in psychology to do the kind of think you are planning here, and yet you achieve all this in 12 hours.

Mr. BACKSTER. Sir, I have given 20 courses and achieved it. We are on our 20th course now.

Mr. Moss. You have given 20 courses. How do you know you have achieved it?

Mr. BACKSTER. We do keep contact with these people when they go out on their field projects and they return for the advanced conferences we hold for them.

Mr. Moss. This is always an in-shop evaluation of your own people and your own system?

Mr. BACKSTER. Sir, we would welcome one from outside the shop.

Mr. Moss. But you have not had it?

Mr. BACKSTER. No, sir; we have not.

Mr. Moss. This, I think, is the thing that is significant here. You feel that the 6-week course is thoroughly adequate and that the high school diploma is a sufficient base upon which to build a career as a polygraph examiner.

Mr. BACKSTER. No, sir; I do not.

Mr. Moss. Then what do you feel would be an absolute minimum for an adequately trained operator or examiner, whichever you prefer to use?

Mr. BACKSTER. Sir, to give an absolute minimum and give anything other than 6 weeks that we are giving now would be in conflict with myself. I can give a suggested length for the course, but not considered as an absolute minimum.

Mr. Moss. Don't you have an idea after many years as to the absolute minimum to be desired in this type of instruction?

Mr. BACKSTER. Yes, sir. On an absolute minimum to be desired I have. That would be 6 months easily.

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Mr. Moss. And the qualifications of the trainee?

Mr. Backster. The qualification of the trainee, the more college the man had the better, the more investigative experience the better.

Mr. Moss. Don't you have a minimum qualification? You are dealing here with a very important subject, the human being. I not only have a strong feeling that he has the rights granted under the law, but I think as our Constitution states God-given rights.

Mr. Backster. I agree with you, sir.

Mr. Moss. There is an area where much damage and mischief can be done with the unskilled.

Mr. Backster. Sir, this is an area in which I have worked harder than most to see that such damage is not done.

Mr. Moss. Then you must have an idea as to the absolute minimums to be desired to achieve the type of operator in whose hands we would entrust what could well be the individual fate of a human being.

Mr. Backster. Sir, may I comment on what I think is a difference of opinion that really is not so if we think of it in terms of reality.

Mr. Moss. I think it would be most helpful if you would respond to my question as to your judgment of the minimums.

Mr. Backster. That is what I am trying to do, sir.

Mr. Moss. To that you may respond.

Mr. Backster. Sir. I think you have handicapped me where I can't. I was to talk of the disciplining of the examiner once he is operating in the field. There is a restriction of his behavior.

Mr. Moss. I think it most important that you have certain basic training rather than go into a period of self-evaluation.

Mr. Backster. No, sir; self-regulation.

Mr. Moss. Or an evaluation by the same system that produced you in the first place.

Mr. Backster. Sir, I am speaking of self-regulation. Regulatory measures to be sure that these things do not happen.

Mr. Moss. The basic question here is whether there is sufficiently established as a science, a skill, or a field of knowledge, to be dependent upon to the extent it is now being dependent upon by agencies of the Federal Government. So it is an evaluation of it as it is, and the things it should be if it is not now adequate. You have responded to my request as to whether you regard the 6-week training period as adequate by saying that you do not.

Mr. Backster. I do not consider it as—I can't——

Mr. Moss. You either do or you don't, Mr. Backster.

Mr. Backster. Under the circumstances I do consider it to be.

Mr. Moss. Under what circumstances?

Mr. Backster. Under the circumstances that do not allow college-grade people to be available at police departments to train them at the present time and they cannot be away 6 months.

Mr. Moss. If a minimum requires a college education to do an adequate job, then we should not be satisfied with less than adequate because if we are we are abusing people. If you have strong convictions as to the rights of individuals, certainly you can see that. Do you have a personal opinion as to the minimums?

Mr. Backster. Yes, I have a personal opinion by desire.

Mr. Moss. Do you desire to have this record reflect?

Mr. Backster. Certainly.

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Mr. Moss. Then state it.

Mr. BACKSTER. As quickly as it can be accomplished and where the police departments are having available to them or avail themselves of college graduates in sufficient quantity to satisfy this college requirement I feel they should do so. In the meantime they should not terminate all their services because they do not have a college level examiner. As far as the basic experience is concerned, prior to training, I think the more investigative experience a person has the greater. The University of the State of New York has not chosen to put a minimum on that. I only can offer what they have asked or imposed upon us through their State board.

Mr. Moss. In other words, you feel that the end justifies the means?

Mr. BACKSTER. No, sir; I am the last to think that.

Mr. Moss. I wonder if we might have some comments from you, Mr. John Reid, again getting more specifically into this question of qualifications which you have set forth—no, Mr. Lindberg, I believe you set it forth—about five points this morning, if I recall correctly.

Mr. LINDBERG. Yes.

Mr. Moss. Do you feel that constitutes an adequate minimum for operators of the polygraph?

Mr. LINDBERG. The points I brought forth this morning?

Mr. Moss. Yes.

Mr. LINDBERG. Yes. This is our present opinion.

Mr. Moss. And that additional knowledge as to the physiology of the human body is not required beyond that.

Mr. LINDBERG. No, I don't believe that at all. I pointed out in these comments that the training facility which, of course, forms the examiner, and my point (d) it must be one which includes supplementing the standard college courses in the fields of physiology and psychology with specific information from these sciences as it relates to the detection of deception.

Mr. Moss. Would there be any difference in the responses you might receive from a person who has this smoking habit as badly as I have and one who does not have it at all?

Mr. LINDBERG. We don't find any relationship.

Mr. Moss. Have you undertaken a study to determine whether there is?

Mr. LINDBERG. Not specifically, no.

Mr. Moss. Yet we are told that this has quite an effect on the physiology of the body, particularly blood pressure, and respiration. If you had a subject who had been a heavy smoker and was in the middle of a test and was not smoking at the time, what might it do to his responses?

Mr. LINDBERG. Our experience reflects the fact that it does nothing relevant to our recordings. It does not result in any erroneous responses.

Mr. Moss. Sometimes when I go someplace where I can't have a cigarette now and then, and I am not particularly enthused about the proceeding I find I become very restless.

Mr. LINDBERG. I do also.

Mr. Moss. Isn't it reasonable to assume, then, that it would have some very definite effect?

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Mr. LINDBERG. Congressman, we don't think so. We know that the contrary is the truth. But if it did affect it would have a similar reflection on the normal questions. The questions that are in the examination, for assessing for us the subject's present physiological status.

Mr. Moss. You don't think the longer the period of time—not having a cigarette would change that pattern?

Mr. LINDBERG. It might but it would change all of the control patterns which are used for the comparative study.

Mr. Moss. You indicated you have a problem of wanting a cigarette. The longer you go without one do you find you are more comfortable or less comfortable?

Mr. LINDBERG. I quit 2 years ago. I don't have the problem any more. But to be responsive, I think the answer is that the subject tends to be more uncomfortable in a very specific manner.

Mr. Moss. Do you determine what that manner is?

Mr. LINDBERG. Well, you might say, discontent.

Mr. Moss. You should really know precisely what it is, shouldn't you? If you have a subject in there who is a heavy smoker and is not smoking during the course of the examination shouldn't you know what the effect is of not having another cigarette midway between the examination?

Mr. LINDBERG. Our evidence indicates not.

Mr. Moss. What evidence do you have?

Mr. LINDBERG. The 30,000 polygraph records that are part of the basis of the whole science or art as it stands at this point.

Mr. Moss. How do those records reflect which are smokers and which are not, which are one pack a day, two packs a day, or more, and how long they have been without a cigarette in the course of a polygraph examination?

Mr. LINDBERG. Unless the examiner specifically inquired of the subject they don't reflect that at all.

Mr. Moss. Then if this is scientific, and this has been set forth as a scientific field, you should know and that should be a standard question on every single examination, and the effect of that upon the subject should be fairly well established so that it can be considered in the course of getting or reading the graphs taken throughout his examination.

Mr. LINDBERG. I don't believe, Congressman, that there is any scientific support for that statement.

Mr. Moss. Do you know of any scientific support to contradict it?

Mr. LINDBERG. Yes.

Mr. Moss. Would you cite it.

Mr. LINDBERG. The body of polygraph records upon which we have formulated our technique.

Mr. Moss. I think we can agree those would not be relevant because the determination has not been made in that body of records. If you are talking of science—you are talking of a procedure whereby you attempt to observe phenomena and determine their ability to repeat themselves under the same conditions, or the manner in which it differs under varying conditions. Smoking is one of the most widespread habits that American people have. In fact, I imagine that at the present time under the pressure of considerable press comment

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and studies released within the last few years, that may even engender on occasion certain guilt complexes. What might that effect be on a person who is discussing a wide range of subjects in the course of a polygraph examination?

Mr. LINDBERG. Based on our experience, none.

Mr. Moss. Again, have you undertaken this evaluation in your experience in each case in order to correlate it and determine whether or not it has validity?

Mr. LINDBERG. No, we have not.

Mr. Moss. Therefore you have no experience on it, have you?

Mr. LINDBERG. No, I would not say that either. You asked for a scientific——

Mr. Moss. You referred to this as "scientific." If your case histories have any validity, it is only as they are correlated and certain determinable facts are extracted from them. Whether it is a case of how many aspirin did you take this morning—which I believe has a depressing effect upon the blood pressure—what type of antibiotics are you using, what types of pressure have you been under? In the case of employment maybe someone is desperately seeking employment, and while it may be characterized as voluntary he is told, "You either take it or you don't get the job," so there is an element of compulsion. All of these things, if these records are to mean anything, must be extracted from the records and must be reflected in the records and must be evaluated and must be analyzed and must be correlated, or we merely have 30,000 individual cases, not a body of scientific information.

After all, in scientific research and evaluation, the most painstaking recordkeeping is undertaken that characterizes anything in human endeavor. This is one of the things, as I have reviewed over the months—the work of the subcommittee staff, I have found most disturbing, that is, this element of scientific objectivity in the work of the polygraph operators. I know Dr. Inbau, you used the term this morning in the case of training of people, I believe, with police forces where you said: "Oh, on occasion it is not important if you regard this as a psychological gimmick."

So I assume on occasion it is regarded as a "psychological gimmick." I believe I am correct. I wrote the term down here.

Mr. INBAU. I said, Mr. Chairman, that there were some people who were using the polygraph as a psychological gimmick for interrogation. Some of these people could not make a diagnosis at all as to whether the person is lying or telling the truth. I think either this morning or yesterday I said you actually don't need to invest in a polygraph, you can use a mimeograph machine for the same purpose. So I think that was my statement, that it is used by some people as a psychological gimmick for interrogation purposes only, not for a determination of truth and deception.

Mr. Moss. If it is used it should be used with great care, with objectivity, by the most experienced person available in interpreting the results obtained from it.

Mr. INBAU. Yes, sir.

Mr. Moss. Do you have further questions?

Mr. REUSS. Yes, I have several questions. Mr. Backster, I think I heard you testify just a few minutes ago in response to a question from

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Congressman Moss, that 6 weeks was not really adequate to train a competent polygraph examiner. Did I misunderstand?

Mr. BACKSTER. Sir, I avoided stating that I felt it was inadequate because if I felt it inadequate I would have no part in doing it now or doing it for the last several years, ever since 1951. I think it could be improved upon, but I do not think it is inadequate.

Mr. REUSS. Do you think in 6 weeks you can train a polygraph examiner so that he is capable of conducting both criminal and pre-employment tests?

Mr. BACKSTER. Yes, sir. We do do this. This is a matter of record. I mean we have to put in late hours at night and work Saturdays sometimes and really cram the instruction more than we would like to. But we do accomplish a basic groundwork by which they can do this when they leave.

Mr. REUSS. As I understand it, you have set up the Army Lie Detector School method at Fort Gordon.

Mr. BACKSTER. No, sir. They have adopted a fair amount or portions of the combined method that I assembled, that was really made up from all techniques in the field. It should not be distinguished as mine as such.

Mr. REUSS. Is your standardized polygraph note pack in use by the Army School?

Mr. BACKSTER. To a limited extent, sir, yes.

Mr. REUSS. What do you mean by "a limited extent?"

Mr. BACKSTER. They don't seem to have the availability of the funds to even buy the material at basic printing cost.

Mr. REUSS. Mr. Lindberg, you testified with respect to certain polygraph test conducted by your organization in recent years, and I think you testified that in one case as a result of the polygraph tests you verified that the subject had committeed some 400 burglaries and 50 robberies.

Mr. LINDBERG. Yes.

Mr. REUSS. Were those armed robberies?

Mr. LINDBERG. As I recall, the report, I think there was a mixture of strong-arm and armed robberies.

Mr. REUSS. I think you also testified that there is a canon of ethics in the profession whereby you do not turn over to the law enforcement authorities the information of criminality which you adduce in your examinations.

Mr. LINDBERG. No, there is no canon as such. Of course, we are at the present time, just as you gentlemen are, evolving codes of practice in that regard. Our present attitude——

Mr. REUSS. I hope you are moving faster than we are, but go on.

Mr. LINDBERG. There is some evidence that we are not. The practice has been in the field to retain adverse information that the subject may state during an examination that is not relevant to the inquiry.

Mr. REUSS. I think you testified that in your experience there had been one exception to this rule and that was in the case of an arsonist.

Mr. LINDBERG. That is correct.

Mr. REUSS. This evidence of criminal arson you did turn over to the prosecuting authorities.

Mr. LINDBERG. Yes. The subject had expressed an intention to continue his arson that very day or the next day.

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Mr. REUSS. I think you said that you first tried to get the subject's lawyer to voluntarily turn this information over to the authorities but the lawyer refused to do so.

Mr. LINDBERG. Yes. We suggested to the lawyer the imminence of the danger here—the attorney said, "I don't think we will take any action on that." He was not impressed with that fact. So we stated to him that we felt a responsibility in this regard and that we would wait 3 days for him to take appropriate action which might be psychiatric counsel. When I called him 3 days later, he said, "No, we are not going to do anything about that." It was in regard to that response that we acted.

Mr. REUSS. By acting, you mean turning it over to the State's attorney?

Mr. LINDBERG. Yes. In the particular case it was the juvenile authorities.

Mr. INBAU. It was actually turned over, Mr. Reuss, to the judge of the juvenile court. It was given to him.

Mr. REUSS. Did the prosecuting and judicial authorities proceed to do something on the basis of this?

Mr. LINDBERG. Yes, they did.

Mr. REUSS. Was there a conviction obtained?

Mr. LINDBERG. There was a partial conviction on 12 arsons and an acquittal on the 13th.

Mr. REUSS. Was this the only case of turning over information as to criminality to the law enforcement authorities?

Mr. LINDBERG. It is the only one I am aware of, other than in the screening of police officers. As I expressed this morning, any disclosure regarding robberies, burglaries are relevant information as defined by the nature of the examination. Therefore, that information is turned over as the burglaries were.

Mr. INBAU. In that instance, isn't it true that the individual knows that these disclosures will be made? He knows that in advance of the test, Mr. Reuss.

Mr. REUSS. When he is taking an examination for a police officer?

Mr. INBAU. Yes.

Mr. REUSS. When, however, he is taking an examination for any one of the other occupations and callings——

Mr. LINDBERG. No disclosures.

Mr. INBAU. That is reserved.

Mr. REUSS. I think you said, Mr. Lindberg, there have been several murders uncovered by the polygraph.

Mr. LINDBERG. There have been instances where murders have been admitted by subjects undergoing polygraph examinations for other issues. For example, private polygraph examiners do a considerable amount of testing for defense counsel. It could be during the course of such an examination that an individual might admit of other crimes.

Mr. REUSS. I did not ask you for hearsay. I asked you only for your own experience and your organization with which you have a personal familiarity.

Mr. LINDBERG. That is our experience.

Mr. REUSS. And you have uncovered several murders?

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Mr. LINDBERG. They have been admitted to by the subject. We don't have personal direct knowledge.

Mr. REUSS. But in several cases the subject admitted committing the act of murder?

Mr. LINDBERG. Yes.

Mr. REUSS. And you kept that information confidential?

Mr. LINDBERG. Yes.

Mr. REUSS. Do you have in your organization a standard polygraph room?

Mr. LINDBERG. Yes; six of them.

Mr. REUSS. You have six such rooms?

Mr. LINDBERG. Yes.

Mr. REUSS. That is in the city of Chicago?

Mr. LINDBERG. Yes.

Mr. REUSS. Are they substantially identical in their architecture?

Mr. LINDBERG. Yes.

Mr. REUSS. Will you describe a typical polygraph room in your organization.

Mr. LINDBERG. Yes. They are a room approximately 12 by 14 containing, in our particular instance, a Reid polygraph, which I think has been adequately described, a chair for the examiner to conduct his examination from, a chair for him to conduct his interview from, and a chair for the subject to be seated in.

We try to avoid any distracting decorations or anything of that nature. Most polygraph laboratories are also afforded the psychological mirror, as it is called, or the two-way mirror.

Mr. REUSS. Does yours have a two-way mirror?

Mr. LINDBERG. I believe five of them do.

Mr. REUSS. Am I right in thinking that a two-way mirror is a mirror which looks like an ordinary mirror but which permits someone to stand behind the mirror and look out?

Mr. LINDBERG. Yes; that is correct.

Mr. REUSS. You say five of your six rooms have such a mirror?

Mr. LINDBERG. Yes; that is correct.

Mr. REUSS. What does it look like to the subject, just a mirror on the wall?

Mr. LINDBERG. Just a mirror.

Mr. REUSS. Where is it?

Mr. LINDBERG. It is located right in front of the subject in most cases. In every case in our laboratory.

Mr. REUSS. Can he see his face in the mirror?

Mr. LINDBERG. No, he cannot. It is positioned in such a way that he would hopefully be seeing nothing more than you would be looking at this wall——

If he looks around can he see the mirror?

Mr. LINDBERG. Yes. The mirror is forward 5 feet and to the upper right 3 feet, let us say.

Mr. REUSS. As a matter of standard operating procedure is someone positioned behind the mirror to observe?

Mr. LINDBERG. No. It has the function of training new examiners and also in cases where a woman is being tested, we may station a laboratory secretary behind the mirror; although there has never been an incident, if we feel the nature of the case is such that might pre-

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cipitate such an incident we would station a laboratory secretary behind the mirror.

Mr. REUSS. Is the subject told of the existence of the two-way mirror?

Mr. LINDBERG. Yes, if he asks, but if he does not ask——

Mr. REUSS. What percentage of the subjects ask?

Mr. LINDBERG. I would say 5 percent, perhaps. Practically every policeman that may be examined does.

Mr. REUSS. What percentage of your subjects are policemen?

Mr. LINDBERG. I really don't know, but I would say it is probably in the area of 5 to 10 percent.

Mr. REUSS. So if you leave aside policemen, practically zero percentage realize that they are subject to surveillance from behind the two-way mirror.

Mr. LINDBERG. That is correct.

Mr. REUSS. In addition to the two-way mirror, are there any other things that do not meet the eye, so to speak, of the subject, outside of the polygraph machine?

Mr. LINDBERG. There is a room community or, an intercom system in our lab, which is exposed to every subject. As to whether or not he perceives it as such, I really don't know. No subject has ever commented on it.

Mr. REUSS. Is there a microphone?

Mr. LINDBERG. Yes. It is a talk-a-phone as you would have—an intercom. It is what they call—I don't know what you call it—in my office if I wish to listen to that laboratory I could.

Mr. REUSS. Where is that positioned?

Mr. LINDBERG. Right at the polygraph instrument. Right on the desk at the polygraph instrument.

Mr. REUSS. Is it a standard intercom with an obvious loudspeaker device in it?

Mr. LINDBERG. It is a commercial model. It is made right in Chicago. We bought it right off the stands. It is not concealed or in any way designed to avoid the attention of the subject. If the subject says, is this a microphone or whatever you might want to call it, the answer is "Yes," and there is no effect to conceal it. We have no reason to do that, Mr. Reuss.

Mr. REUSS. If the subject does not say anything about it, is he told of its existence?

Mr. LINDBERG. No. Because usually there is nobody listening anyway.

Mr. REUSS. Are recordings made of the subject's responses?

Mr. LINDBERG. Tape recordings?

Mr. REUSS. Yes.

Mr. LINDBERG. No.

Mr. REUSS. Any other types of recordings?

Mr. LINDBERG. Yes; the examiner makes notes as he proceeds throughout the examination.

Mr. REUSS. But there has never been a case in your organization of a tape recording made?

Mr. LINDBERG. Yes. If there is a specific case that we want to make a tape for, one, for example, we anticipate might be a good training aid or an unusual case, we may preserve it for tape recording or by tape recording.

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Mr. REUSS. Yours is a private organization, is it not?

Mr. LINDBERG. Yes.

Mr. REUSS. While you do work for public agencies, you have no official status?

Mr. LINDBERG. My answer is we do not have any official status.

Mr. REUSS. Without reference to your organization, of course, but bearing in mind the confessions of criminal action which I gather frequently occur, would there not be an opportunity for unscrupulous private polygraph examiners and operators to use information obtained from a subject for the purpose of blackmail or extortion?

Mr. LINDBERG. I presume that is possible, yes.

Mr. REUSS. Mr. Inbau, you testified, I think yesterday, concerning a very elementary type of detector, which I believe you felt was discredited, which consists not of the three-part devices which measure—check me if I am mistaken—blood pressure, respiration, and skin sensitivity, but which in the case of this discredited device records simply skin sensitivity. Do you recall your remarks on that?

Mr. INBAU. Yes.

Mr. REUSS. Do I state what you said correctly?

Mr. LINDBERG. I think you do essentially. Essentially what I said specifically was that one particular unit alone is totally inadequate for the purpose of detecting deception. (See exhibits 7A–7E, pp. 185–187.)

Mr. REUSS. By that one particular unit?

Mr. LINDBERG. The galvanic skin reflex.

Mr. REUSS. Which shows skin reflexes?

Mr. LINDBERG. Yes.

Mr. REUSS. Educate me a little bit on this skin reflection business. I have the general impression that by and large someone with a guilty conscience may have a clammy hand, a sweaty hand, not perhaps dripping with sweat, but indicating some changes in either the temperature of the skin or the amount of liquid that approaches the surface. Is this a solid psychological observation that I am making?

Mr. INBAU. Mr. Lindberg answered the question yesterday with reference to the galvanic skin reflex. I would like if I may defer to him in answer to your question specifically.

Mr. REUSS. I will give him an answer in just a minute.

Mr. Moss. Mr. Reuss.

We have a quorum call. Can we take a 20-minute break?

Mr. REUSS. Yes; I will resume this question.

Mr. INBAU. I don't want to evade your question.

Mr. REUSS. I know you don't.

Mr. Moss. We are going to recess for about 20 minutes to permit the members to respond to a quorum call.

(Whereupon, a short recess was taken.)

Mr. Moss. The subcommittee will resume. Mr. Reuss.

Mr. REUSS. Thank you, Mr. Chairman. Mr. Inbau, proceeding on the subject which we were discussing, which is the effectiveness of the single method testing device for testing——

Mr. INBAU. The galvanic skin reflex.

Mr. REUSS. I would like to have you tell me, and later on to the extent that he can add something I will ask Mr. Lindberg to add to it, I wish you would tell me what the galvanic skin reflection detector detects and why it is not a reliable gage of whether somebody is telling the truth or not.

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Mr. INBAU. There is a considerable difference of opinion just what is this galvanic skin reflex. It does have something to do with the skin resistance. There is an imperceptible current of electricity that goes through the electrodes. It has been our observation over the years that while experimentally it can be helpful in detecting a laboratory lie situation, in actual cases its utility, at least this has been our experience, is limited pretty much to what is known as the peak of tension test. When you are dealing with an actual case situation of the type we are talking about where you use your control question and your relevant question, there the galvanic skin reflex is of very limited value and utility.

You depend upon the respiration, blood pressure, plus traceage rather than upon the galvanic skin reflex.

Mr. REUSS. What is the galvanic skin reflex? What does this meter show?

Mr. INBAU. As I say, there is a difference of opinion and some varying explanations just what it is you are picking up here and this is a pretty involved thing here. Perhaps Mr. Lindberg can capsule it as I think he did the other day. What I am saying is that it is a very sensitive recording you get. Experimentally, it will pick up these little things that don't get to the deep-rooted emotional factors that are involved when a person lies about something of considerable consequence such as a crime and things of that sort.

Mr. REUSS. Let me ask you this: What is the technique of the galvanic skin lie detector? Where do you attach it to the subject? To his hand?

Mr. INBAU. The hand, the fingers.

Mr. REUSS. The palm of the hand?

Mr. INBAU. Yes, or the fingers.

Mr. REUSS. That suggests to a layman like myself that it may have something vaguely to do with the ancient, commonsense manifestation that a sweaty or clammy hand or palm is an indication that you are dealing with somebody with some guilt feelings. Is that what the galvanic device tests?

Mr. INBAU. It will pick up that sort of a condition, a physiological change, yes. As I said before, this is not looked upon, at least in our opinion, as a reliable indicator because you have all these other factors entering into it.

Mr. MOSS. Doesn't it measure a surface current? It is simply a galvanometer that is similar to that used in electrical work. It is a little more sensitive and you are measuring the flow of current on the surface of the skin which is usually stepped up because of more moisture, and change in the temperature.

Mr. INBAU. That is correct.

Mr. MOSS. It is simply the measurement of an electrical current.

Mr. INBAU. Yes.

Mr. REUSS. Suppose in this connection you gave me a galvanic skin test today in this room, and let us suppose you had given me such a galvanic skin test in this room yesterday, you recall how uncomfortable it was, how much like a Finnish sauna, and you asked me the same innocent question both days, wouldn't I have displayed more galvanic dynamism, or whatever the phrase is, yesterday than today?

Mr. INBAU. I think you would find a difference.

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Mr. Reuss. Yet, I would be as innocent or guilty one day or another, would I not?

Mr. Lindberg. Not from one question to another, if I might make that observation. It is a continuing condition yesterday as it is today. In other words, you are not asking a man yesterday a normal question and then today under a different atmospheric condition, so to speak, of humidity, asked him if he killed a person. He is being asked both the normals and the relevant questions under the same basic condition of humidity or lack of humidity.

Mr. Moss. Would you yield at that point?

Mr. Reuss. Surely.

Mr. Moss. Again, I think this goes to the heart of whether an activity is a science or whether it is not. Mr. Reuss has raised a question as to the responses you would have gotten yesterday when this room was very warm and uncomfortable in contrast with conditions prevailing here today when it is far more comfortable. Mr. Lindberg, you said between questions there would have been no difference. Isn't it quite conceivable that there would have been? You are not as relaxed, you are a little more on edge, perhaps irritated at the surroundings; you find you are perhaps a little jumpier. The matter of the immediate environment has a strong impact upon people. A few warm days that are humid and people become short tempered and they are not the sweet souls they were when the weather was cooler. Doesn't this have some significance in determining the response even between questions? Maybe they might be very mildly irritated today, but yesterday the irritation would have been much greater.

Mr. Lindberg. That is a good observation. That is correct.

Mr. Moss. From the standpoint of applying it to a science, it is a significant factor which would have to be considered, and some correlation determined, if we are in fact proceeding in a scientific manner to develop the techniques for the interpretation of the graph readings obtained. Not only that, but respiration is affected in like surroundings, blood pressure probably is affected in like surroundings. So, the results you get, unless you are air conditioned in your laboratory in Chicago, might be different in the summer than they are in the winter. Have you studied this to determine what the correlation might be?

Mr. Lindberg. The degree of responsiveness of a subject at any particular time, and I mean by time from one day to the next, may definitely change. He may be far more responsive on the control question on every question on the examination on one day than he would the next. But within the examination itself, this heightened sensitivity to which you are referring occurs on the normals for that day. The purpose of the normals is to reflect the condition that you are suggesting, Congressman.

Mr. Moss. How do you establish the fact that is the case?

Mr. Lindberg. By observation. Probably the oldest scientific technique known.

Mr. Moss. The oldest scientific technique known and therefore in the observation you note the results of the observation and then you attempt to correlate it with the other case histories to see if the phenomenon repeats. Have you done this?

Mr. Lindberg. Which phenomenon?

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Mr. Moss. The difference that might be obtained in asking a series of questions from similar subjects under varying environments.

Mr. LINDBERG. Yes, it is a continuing study.

Mr. Moss. How is the study carried on? What type of records do you keep on this? In these 35,000 cases, can you go back to them and give me some idea of the environmental conditions?

Mr. LINDBERG. Most certainly.

Mr. Moss. That is recorded on your forms?

Mr. LINDBERG. I hope I know what environmental conditions you are speaking of.

Mr. Moss. Immediate environment.

Mr. LINDBERG. Yes, definitely.

Mr. Moss. Whether the room is hot or cold?

Mr. LINDBERG. Yes.

Mr. Moss. Or humid or dry?

Mr. LINDBERG. Yes. If there are no notations to that effect on the question sheet, it is presumed that it was within——

Mr. Moss. You cannot presume in science. You can't say if it isn't there. You must say it is there and noted and observed as a part of the phenomena on each and every case and at some point we determine certain patterns exist. If you do not do that, you have not undertaken a scientific procedure.

Mr. INBAU. Mr. Moss, I wonder if I might speak to that point?

Mr. Moss. Mr. Reuss has the floor.

Mr. REUSS. Why don't you speak to that.

Mr. INBAU. It seems to me we are making a scientific evaluation here. If you have 30,000 cases and you come to a conclusion as to innocense and guilt and subsequent developments substantiate you to the degree that we say are substantiated, it seems to me we are safe in concluding that this is a reliable technique, even though we are not giving it the various kinds of evaluations that perhaps you give to certain other types of activities or testing. This one doesn't lend itself to anything more than what we have put it to.

Mr. Moss. Is it true that it doesn't lend itself or it is not perhaps within the economic framework of the undertaking to extend the investigations to include these other factors. You say that 30,000 cases where you have determined guilt or innocence. Once that case goes out into the field, do you have a follow-up on each of them to determine whether you have made a correct judgment?

Mr. INBAU. Yes; to the extent that we can.

Mr. Moss. You know, Doctor, far better than I. You have been associated with the university for many years and I imagine you have many friends and colleagues engaged in scientific pursuits, that when you talk of science you are not talking of "if and when" it is convenient. You are talking of something that is very precisely followed in infinite detail and we are here dealing most certainly with diagnosis of human reaction. It is science. But whether the techniques employed here are those scientific techniques—and I believe we have a right to expect this, if we people are to be subjected to this type of examination—is an important question before this committee. Because, at the moment, our Government engages extensively in this.

It impinges upon the rights and the privileges of our citizens. Yet, there does not seem here to be from your records the scientific pro-

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cedure which would produce the answers which I think come from any reasonably probing examination. I don't think the questions I have asked are unreasonable or unfair.

I believe that if we are to use these devices and operators rely upon them to interpret human responses, then we should have the scientific notebooks full of the data that will fully support their reliability.

Mr. INBAU. I suggest to you that they are full to the extent that they can be filled for this reason.

Mr. MOSS. No; to the extent that you have done it, not to the extent that they can be. You could follow each and every case. You could follow each and every case from the day of examination to the day of ultimate death or resignation. That could be done. If it were to be scientifically undertaken, you would follow it perhaps more extensively than you have. You follow it now within the framework of the economics of the activities in which you are engaged. But it is being treated as a science. I have serious doubt that it is a science.

Mr. INBAU. The limitation that I was referring to is this. Here is some money stolen. There are six people that have likely had access to it. You test them all and report that they are all innocent. Now, nothing ever comes to light disclosing who it was that stole that. There is ability in practical limitation here. You cannot take the conscience of these people apart on an operating table and find out that one of the six you said were innocent actually was guilty. It seems to me you just have a limitation.

Yet, I don't know that you can overcome it in any other way. You can't subject this technique to laboratory experiments. You can't set up hypothetical crime situations. That is too far removed from actual criminal cases.

Mr. MOSS. You are not only using this in criminal cases, you remember.

Mr. INBAU. Yes; personnel.

Mr. MOSS. A great number of instances of use in Government relates to personnel screening. So, we do conduct extensive experiments in human behavior and the human psyche, don't we?

Mr. INBAU. Yes.

Mr. MOSS. We spend millions of dollars every year attempting to learn why people behave as they do. In this field of personnel screening, I think it is extremely important, if we are going to employ a technique that is very reliable. We are supposed to protect everyone to the best of our ability, and a system that might catch 94-percent accuracy, we will say, but condemn the other 6 percent to some disadvantage because of its failures is not at all in accord with our principles, is it?

Mr. INBAU. I don't know that I followed your statement carefully enough to give it the answer. But again I say, and this is about the only answer I know we can give, that here we have a certain type of test procedure, a certain type of testing, that can only be checked upon to the extent that there are disclosures which ultimately develop that either prove or disprove the accuracy of the diagnosis that has been made. It seems to me that if you have 30,000 cases and you have these developments establishing nothing more than 1 percent of error in that diagnosis, that you have a foundation there upon which to build the conclusion that it is a reliable aid.

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Mr. Moss. I thought Mr. Reuss developed the fact yesterday that we didn't have the 99-percent accuracy. Actually, your cards could be more complete. We have discussed two things here today. I discussed the matter of cigarette smoking. Your cards don't reflect this. I don't know if you have assurances from men well versed in the field of human physiology that there is no important reaction here. I don't know whether you have gone to the trouble of determining from the best psychiatric sources that perhaps there might not be some possibility of an impact of an emotional nature of this if a person was subjected to a lengthy test and deprived of his cane. But your records don't reflect whether he is a heavy user or not. We talked about the immediate environment, the hot room with high humidity and the cool room with relatively low humidity. This is not reflected in your cards. These are factors that are unevaluated.

Mr. INBAU. I think there is one factor that is being overlooked here, that you are recording not only involuntary physiological reactions but very voluntary ones, such as in respiration. If you give a man a test, you have the control questions—let us say this happens—you ask him the control question and you get this suppression in respiration characteristic of a lie reaction.

Mr. Moss. Is it characteristic of any other reaction?

Mr. INBAU. The suppression of respiration?

Mr. Moss. Yes.

Mr. INBAU. It could be if you depended on that one reaction alone. But here you have it on the control question and you don't have it on the crucial question.

Mr. Moss. What other reactions could it be typical of?

Mr. INBAU. The individual suppression at that particular time?

Mr. Moss. Yes.

Mr. INBAU. It could be an accidental occurrence.

Mr. Moss. Could it be symptomatic of some other physiological disturbance?

Mr. INBAU. If it is, you are going to have something of that nature throughout the record or a repetition of it throughout the record. You are not going to have it isolated in these particular questions and have it duplicated on a series of tests.

In other words, on three tests, you will get this suppression in respiration at the control question. You don't get it at——

Mr. Moss. Are you saying that it is impossible for it to occur on a series of questions?

Mr. INBAU. I wouldn't say anything is impossible here, but it has been our experience that it just doesn't work out that way. I don't know anything else we can rely on.

Mr. Moss. You have taken it on the basis of a response to a question without relating it to the overall physiological function of the person before you.

Mr. LINDBERG. I might respond that the same problem that you are suggesting, of course, would require considerable more definition than you are allowing us at this point and considerable more explanation. But the random occurrences that you are suggesting are also the problems which the other sciences, as I think you would agree they are sciences, cardiology, neurology, and these other medical sciences, are confronted with that same element of probability. They are

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dealing with everyday life and death matters. I might also suggest or ask of you, Mr. Chairman, if you would give us some direction in answering your question as to what science you would consider adequate, what medical practice is adequate for us to more or less parallel in our recording of observational physiological data. I presume you have one in mind.

Mr. Moss. No, I haven't. I am going to attempt before we complete the hearings on this subject to seek, however, opinions from medical specialists and from specialists in the field of psychiatry, and if possible, arrange an appropriate panel where this matter can be discussed. I know I go in for electrocardiograms at least twice a year and the operator who gives them to me is a very competent operator. But I would not want to rely on her interpretation of them, her diagnosis of my then current condition.

I look to my doctor who has had many years and is alert to all of the things that could bring about those little peaks and valleys in that reading.

Normally, he is not going to make a judgment just on that. He is going to have many other tests taken. Then his diagnosis is probably going to be made with considerable humbleness on his part, recognizing the large latitude existing for error. But here we are also dealing with what could be economic life or death for an individual.

Mr. LINDBERG. Or life and death possibly.

Mr. Moss. Or life and death. Yet, we haven't the same highly qualified diagnosis. You are using the same basic material. You are having the body report on its functions, and you are diagnosing them but the diagnosis is made in most instances by a person with less training by far than that nurse who gives me my test.

Mr. LINDBERG. I would suggest that it would be very illuminating in order to place the polygraph field in its proper perspective as a science to subject these psychiatrists that you are going to call and the medical people to the same type of cross-examination that you have engaged in here for the purpose of comparing the two.

Mr. Moss. We would. Most certainly, we would.

Mr. LINDBERG. I would be interested to see if there is a significant difference. Because our people at the Northwestern Biomedical Engineering Staff have been unable to find any immediate corrections in our procedures that would bring more of what you desire into our field.

We are constantly working on these problems. They are not answered. One of the limitations is obviously money. We are private individuals engaged in private enterprise. I would hope that one of the results of this committee meeting might be some real good research in these interdisciplinary sciences.

Mr. Moss. We would hope it would lead to improvement, too. Again, I have not with intent, Mr. Reuss, taken the floor from you. You have the floor and I think you should be permitted to continue your questions.

Mr. REUSS. If I could just go back to the galvanic skin detector which Mr. Inbau and I think your colleagues have said is worthless or practically worthless as a sole test. I still don't quite understand how this thing is supposed to work. Who figured out that a given pat-

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tern of responses stigmatizes the liar as opposed to the truth-teller, or are you all prepared to say that it is absolutely worthless?

Mr. LINDBERG. Are you talking about the galvanic skin reflex?

Mr. REUSS. Yes.

Mr. LINDBERG. There are examinations or tests that can be given which in a very substantial number of instances will detect certain types of deception. I might suggest one, where the subject answers no to a series of questions as to whether or not he chose a particular card or a number. When he is instructed to answer no to all of the cards, even when the number that he chose is called, frequently, and even in our laboratory conditions, you will find a rise similar to the one that was seen on this chart here. But, then, when you immediately proceed into the specific issue framework, we have not found in the technique that we use, that there is sufficient consistency for the reliability needed for a scientific assessment, as we conceive of it.

Mr. BACKSTER. Sir, is it possible to comment on that?

Mr. REUSS. Let me proceed, and I do have a question of you, Mr. Inbau. Getting back to this question yesterday of the accuracy of the assertion in the 1953 work by Mr. Inbau and Mr. John Reid, which was the subject of considerable questioning by me yesterday, doubt about the validity of those statistics was also expressed by three people who wrote an article in the November, December 1962 issue of the Harvard Business Review. (See exhibit 2E, p. 147.)

Mr. Backster, you wrote an article in the 1963 issue of Law and Order magazine, did you not, which had something to say about that Harvard Business Review article?

Mr. BACKSTER. Yes, I did.

Mr. Moss. Do you have any more questions of Mr. Reid or Mr. Lindberg?

Mr. REUSS. I have one of Mr. Lindberg. Going back to the business of the two-way mirror which was rather infrequently used in your five polygraph chambers, do you ever use that to give prospective clients or police officers or company officials or governmental officers who might be contemplating the employment of your agency as a lie detector unit—do you ever use that double mirror to give them an opportunity to observe polygraph tests in action?

Mr. LINDBERG. Yes, so long as they have no interest in the individual case itself.

Mr. REUSS. When they do observe this, this is done without the knowledge of the subject that they are being observed by these people?

Mr. LINDBERG. Yes.

Mr. REUSS. Let me conclude, then, before Mr. Lindberg and Mr. Reid go—well, thank you very much.

Mr. Moss. I want to thank you gentlemen for appearing here and I regret that we have had so many delays. I hope you catch your train.

Mr. LINDBERG. Thank you very much, sir.

Mr. JOHN REID. Thank you, sir.

Mr. REUSS. Now, Mr. Backster, I was going to read to you from your February 1963 article in Law and Order magazine. Do you have a copy of that in front of you? (See exhibit 2F, p. 154.)

Mr. BACKSTER. Yes, I do.

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Mr. REUSS. I will just read the relevant sentences and you check me so that I don't misread any of them. The title of your article goes, "Don't Trust the Lie Detector Versus Do Trust the Lie Detector." Then you say:

> The first of the above titles "Don't Trust the Lie Detector" is actually that of a feature article which appeared in the November–December issue of the Harvard Business Review. This shocking injustice to the truly scientific brand of lie detection was authored by Richard A. Sternbach, Lawrence A. Gustafson, and Ronald L. Colier. An insert paragraph states that two of the authors are "professional psychologists who have been doing extensive research with polygraph techniques, the third is a graduate student at Massachusetts Institute of Technology who has studied commercial practice."
>
> One thing you can be certain of is that none of them are authorities, or even well-known practitioners, in the field of scientific lie detection. For these individuals to take it upon themselves to be so critical of a field they know so little about is like this author writing a critical article on the Rorschach inkblot test or the Bernreuter personality inventory, both of these being important tests in the field of psychology.
>
> Despite our justification to challenge these individual's right to present such a totally destructive criticism of a specialty they mistakenly may feel within their realm—the sad part of it is that we, within the polygraph field, have provided them with the ammunition to fire at us.

Then, let us go to page 2, second full paragraph:

> In their subsection entitled "Accuracy and Error" in the Harvard Business Review article, the authors severely criticize the vague, incomplete, and erroneous published polygraph statistics as well as the methods by which they were calculated. We have now been called to task for inadequate statistics released during past years—and what defense do we have? I know of none, and furthermore, if we attempt to defend such statistics of the past we are playing the psychologist's game with his rules and on his home grounds.

The statistics which the Harvard Business Review article authors were criticizing were the statistics of Mr. Reid and Mr. Inbau, are they not?

Mr. BACKSTER. I am not sure if they localize themselves to them but I can check.

Mr. REUSS. Will you take a look at the article and having refreshed your recollection, answer my question?

Mr. BACKSTER. Yes, sir; they quite closely stick to the book "Lie Detection and Criminal Interrogation."

Mr. REUSS. Is it your opinion from the 1963 work I was describing which asserts that among the some 4,200 polygraph cases listed there was only 1-percent inaccuracy—that those statistics are vague, incomplete, and erroneous; is that correct?

Mr. BACKSTER. Sir, I was told this by a statistician whom I consulted to see if there was foundation for the criticism on their part. I know nothing of statistics. I am not an expert in that. I was told that there were some grounds to criticize.

Mr. REUSS. And on the basis of your conference with that statistician you referred to the 1953 assertion and the statistics back of it as vague, incomplete, and erroneous, did you not?

Mr. BACKSTER. Yes, sir; I did.

Mr. REUSS. Thank you; I have no further questions.

Mr. Moss. Mr. Reid.

Mr. OGDEN REID. I have just one or two questions of Mr. Backster.

What are the facts, Mr. Backster with regard to preemployment screening in the industrial field? What is the percentage of individ-

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uals that fail to get the job they are applying for on the basis of a polygraph exam or largely as the result of a polygraph being part of the preemployment personnel inquiry?

Mr. BACKSTER. I could only make an estimate, sir, because we have no facility or no structure set up for centralized statistics because we are dealing among competitors doing this work, this is not an excuse for not having them but is the excuse so far.

I would judge or estimate that about one out of every four that would undergo and have gone on the job by virtue of the conventional forms of screening would have disqualified themselves by their own assertions during the polygraph examination.

Mr. OGDEN REID. Does that strike you as a high figure?

Mr. BACKSTER. I would say initially it struck me as a high figure; yes, sir. I am not shocked by it any more.

Mr. OGDEN REID. Is there any parallel between that statistic and the operation of some of our Government agencies? In other words, are a large number, that is 25 percent, denied reasonable opportunity for employment because of polygraph examinations?

Mr. BACKSTER. In the private practice, and now we are comparing it to use in the Government, and by projection which really is not too fair, they are not deprived of the job by virtue of the polygraph but by virtue of their own behavior during past years.

Mr. OGDEN REID. Did you have any experience with the State of Delaware Police Department?

Mr. BACKSTER. Yes, sir.

Mr. OGDEN REID. What, approximately, were the figures in preemployment screenings that pertained there?

Mr. BACKSTER. I didn't do any screening there, if that is what you mean. I did train an examiner for the State police.

Mr. OGDEN REID. Are you familiar with the figures of the Delaware police?

Mr. BACKSTER. No, sir; just offhand, I am not.

Mr. OGDEN REID. To recapitulate, I would just like to ask Mr. Inbau—Dr. Inbau—of the testimony——

Mr. INBAU. Incidentally, for the record, I am not a doctor. I hold three degrees. I am not a doctor. I didn't want to interrupt before. It sounded pretty good. It was not bothering me but I think I should correct it.

Mr. OGDEN REID. You are very distinguished.

Mr. INBAU. Thank you, sir.

Mr. OGDEN REID. To recapitulate today, are you concerned about the level of training in the Federal Government wherein the polygraph is used?

Mr. INBAU. Yes, sir.

Mr. OGDEN REID. Would you say that a substantial number, perhaps a majority, are inadequately trained?

Mr. INBAU. I would say a substantial number, yes.

Mr. OGDEN REID. Therefore, this is a matter that you think is a case for very serious concern?

Mr. INBAU. Yes, sir.

Mr. OGDEN REID. And would you recommend very prompt studies to develop standards and cessation, perhaps, of these tests until adequate standards and review procedures for the protection of the rights of individuals can be more nearly assured?

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Mr. INBAU. I would say a phasing out of some of this so that this matter could be corrected as quickly as is reasonably possible.

Mr. OGDEN REID. Are there some areas in the Government where there is no need for polygraph examinations at all in your judgment; where it is being used indiscriminately? I can see given great professional competence and for the great security needs of the United States, the National Security Agency perhaps, where there could be a clear need for an investigative function in this area properly administered and carried on. But has the polygraph, in your judgment, spread to too many agencies in the Government in relatively nonvital areas?

Mr. INBAU. That is my impression. But I have no basis really, to say so definitely. I think there will be a tendency for it to reach out beyond the scope necessary for security purposes, yes.

Mr. OGDEN REID. Have you seen it in any agency yourself where you thought it was spread too widely?

Mr. INBAU. No.

Mr. OGDEN REID. You have not?

Mr. INBAU. No.

Mr. OGDEN REID. You are convinced that there is a serious lack of standards in the Federal Government today?

Mr. INBAU. Yes.

Mr. OGDEN REID. Thank you very much.

That is all, Mr. Chairman.

Mr. MOSS. Mr. Inbau, in discussions of the polygraph it has been emphasized that they are always used voluntarily, is that correct?

Mr. INBAU. Yes.

Mr. MOSS. How would you define voluntary in the sense of the person agreeing to take these tests?

Mr. INBAU. Insofar as the examiner is concerned, if this individual realizes, let us say he even vocalizes this, you understand you don't have to take this, are you still willing to take the test, yes. Why back of it this individual may feel that there is some measure of compulsion. If he wants the job he has to take the test.

I am viewing it in a rather localized sense insofar as the validity of the test he is undergoing is concerned.

Mr. MOSS. In other words, it is important that it be voluntarily taken, is that correct?

Mr. INBAU. Yes, sir.

Mr. MOSS. What happens if it is not voluntarily taken?

Mr. INBAU. If the individual is willing to take it he can defeat it very easily by muscular movements. He cannot sit still and cooperate to the extent that is required for an adequate tst. There are all sorts of ways in which he could prevent the examiner from attempting any diagnosis whatsoever.

Mr. MOSS. You could get unreliable readings?

Mr. INBAU. No; the examiner would not make any attempt to diagnose the deception if he was not getting the cooperation from the subject himself. This person may initially have had some resentment of the idea that he had to take this test. But the standard operating procedure, I know as John Reid uses it, you spend some time with this individual in a pretest interview to allay his concern about it, to assure him of the kind of treatment he is going to undergo during the test,

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and that individual, I am very sure in the vast majority of cases, rather readily is satisfied that it is all right for him to go ahead and take this. He may even feel it is a good thing generally to do it.

Mr. Moss. You do the work for police departments and private employers?

Mr. INBAU. I am no longer active in this field, Mr. Moss, I used to be.

Mr. Moss. The normal clients are the law enforcement agencies and private employers, is that correct?

Mr. INBAU. Are you addressing your question to me where I as an individual were doing it?

Mr. Moss. The Reid Co.

Mr. INBAU. No; I am not a part of the Reid Co. at all. I am no longer actively engaged in these tests. I used to be and I worked with Mr. Reid on these publications and that is the extent of my activity at the present time.

Mr. Moss. I was interested really in your interpretation of what is voluntary. If it is the required policy of an employer that they be taken, we will say, for initial employment or in some instances for advancement, and the person has a desperate need for the employment, is that a voluntary taking of it?

Mr. INBAU. I view it from the standpoint of the examiner at the time when the test is conducted. If the individual himself at that time is willing to subject himself to the test I rate that as voluntary. I understand in the broader sense of the term that it could well be said that if he is compelled, he will be fired if he doesn't take it, it is involuntary to that extent.

Mr. Moss. Or if it should adversely reflect on his record that he declined to take it. In other words, there is a penalty for failure to take it, is that voluntary?

Mr. INBAU. In the broadest sense of the word; no.

Mr. Moss. It could be those cases where a fellow said, all right, I will take it, but he has very strong feelings against it, and for all practical purposes he is not a voluntary subject, is he?

Mr. INBAU. Yes; I think in the broadest sense of the word it is involuntary then. What I would suggest, Mr. Moss, if I may, and here again this calls for discretion in the use of it for restricting its scope only to those cases where it is necessary, that when you weigh this fact in terms of national security, it seems to me that the one gives way to the other. I am talking about the morality of this, expecting involuntary to that extent.

Mr. Moss. We are talking here about a field that is not necessarily national security at all. We talked of the private employer.

Mr. INBAU. I was answering your question in terms of the Federal usage of the technique.

Mr. Moss. Even there we have to weigh the moral question of the involuntary submission of a person to this sort of rather imprecise testing, don't we?

Mr. INBAU. I am sorry, I didn't get that.

Mr. Moss. Even in the field of security we have to give some consideration to the requirement that a person involuntarily submit to this or suffer a penalty, don't you think?

Mr. INBAU. Yes; I think you give consideration to it.

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Mr. Moss. We can't have a society that says the end justifies the means, can we?

Mr. INBAU. No, sir; I don't subscribe to that at all. I think there is a middle ground that can be tread on this, though, where you are giving all due deference to the individual, and stacking that consideration up against the broader one of the security of the country.

Mr. Moss. Mr. Inbau, I want to thank you as I did the other gentlemen for your appearance and express the hope that the lengthier session that was contemplated today has not unnecessarily inconvenienced you. I don't believe we have any additional questions. You are now excused.

Mr. INBAU. Thank you very much, gentlemen.

Mr. OGDEN REID. Thank you very much.

Mr. Moss. Mr. Backster, if you would like to sit in the middle there, I think it might be more comfortable for you.

Mr. BACKSTER. Thank you.

Mr. Moss. What is this electronic marvel that weeds out dishonest and unfit applicants?

Mr. BACKSTER. These are terms that are applied by the author of this article, and not by me.

Mr. Moss. Were you interviewed on it?

Mr. BACKSTER. Yes; I was interviewed on it.

Mr. Moss. Is the article accurate?

Mr. BACKSTER. Basically it is a fairly accurate representation; yes, sir.

Mr. Moss. Would you tell me where it is inaccurate?

Mr. BACKSTER. May I get a copy of the article?

Mr. Moss. Yes.

Mr. BACKSTER. May I proceed?

Mr. Moss. Yes, certainly.

Mr. BACKSTER. This article was printed in Bus Transportation magazine in November 1956, and the author who did the work on this was perhaps a little too carried away in his claims. I don't abide by the degree of enthusiasm that I think he placed in this, that here is a machine that permits a prospective employer to know everything about a job applicant which might make him a bad risk as an employee. That is not true.

Mr. Moss. You have had this reprinted?

Mr. BACKSTER. Yes; I did at the same time the magazine printed it. They printed up an x number of prints for me.

Mr. Moss. Do you use this in promotional work in offering your services or selling your equipment?

Mr. BACKSTER. No, sir; we have not for several years, sir.

Mr. Moss. Is this particular piece of equipment used by any Government departments or agencies?

Mr. BACKSTER. This equipment represents two portions of the three portions used, and now we have added to it, in the last couple of years, the third portion ourselves. This brings it back to a basic polygraph again.

Mr. Moss. Is this equipment used by the Government?

Mr. BACKSTER. The same component parts, not this equipment as far as the stand is concerned, the evaluator stand, but the same component parts that are in this are in use by the Federal Government; yes, sir.

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These are sectionalized and they are replaceable by standard replacement parts.

Mr. Moss. On page 2 of the piece—

A number of bus companies are already using the Backster service and have found it invaluable. For in an industry such as ours where employees often handle money and are responsible—

That column; I want to find out if this is an accurate statement—

Backster says that through his evaluator he can give a factual report to a company, a report which covers past dishonesty and undetected dishonesty.

Is that a correct statement?

Mr. BACKSTER. I am looking up here—in fact by the time the job candidate finishes his testing the Backster evaluator can predict whether or not——

Mr. Moss. Right here, the second page of the enclosure. "Past dishonesty and undetected dishonesty."

Mr. BACKSTER. Yes, sir. The word "factual," I won't agree with. It is actually as represented by the man himself. I think we want to consider that.

Mr. Moss. You can give a report but not a factual report, is that correct?

Mr. BACKSTER. Yes.

Mr. Moss. So we strike the word "factual"?

Mr. BACKSTER. Yes; I would strike that, sir.

Mr. Moss. "Past dishonesty and undetected dishonesty," you can give those? Remember this is referring to a particular piece of equipment, the one described in this article.

Mr. BACKSTER. Yes.

Mr. Moss. What is the nature of that equipment?

Mr. BACKSTER. This equipment is actually the same as polygraph equipment without the cardio section in it.

Mr. Moss. It is a galvanometer?

Mr. BACKSTER. It is a recording galvanometer with breathing also being used.

Mr. Moss. Where is the breathing if it only attaches to two fingers?

Mr. BACKSTER. The breathing is actually, as I mentioned to you, this is a schematic diagram for simplification purposes. It has schematic written on the original diagram. This is merely to show without the complications of breathing tracing being there——

Mr. Moss. I was trying to determine in the text of the article the inaccuracies. It describes it as a simple electronic:

If this all sounds like a Buck Rogers fantasy, remember that this is the age of electronic wonders, and anything can and does happen. The man responsible for bringing electronic evaluation to the personnel field is Cleve Backster, who has yet to hit his 40th birthday, but is already recognized as an authority and consultant in the field of polygraph, or lie detector, work.

In the course of designing and improving psychological laboratory equipment, Backster conceived the idea of a completely new and extremely sensitive emotional response evaluator which could be employed with oral and written tests to screen the backgrounds of job applicants.

It says:

with the Backster evaluator the technique used is entirely different. Through two little ring contacts placed on the fingers of the job applicant, it records extremely minute physiological changes.

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If it is only the two little rings, how do you get the respiration?

Mr. BACKSTER. It says there are two little rings that do record that, but it does not mention that there are attachments recording breathing, At the time this system was introduced there was an attempt to portray it without the stigma of the polygraph or lie detection connotation.

Mr. Moss. How is it sold?

Mr. BACKSTER. It was sold as an evaluation of the job applicant.

Mr. Moss. Then it was a galvanic skin metering or measuring device?

Mr. BACKSTER. It was not metering. It was a recording device and also with breathing being used.

Mr. Moss. Where was the breathing connected with on this picture of you in this chair?

Mr. BACKSTER. It is not on me, sir.

Mr. Moss. Then the article is incorrect in describing that?

Mr. BACKSTER. Yes, that is correct.

Mr. Moss. That is what I was trying to find out.

Mr. BACKSTER. Yes, sir; it is incorrect in that regard.

Mr. Moss. So it could not do it as the article said?

Mr. BACKSTER. Not without the breathing; no, sir.

Mr. Moss. On this one you didn't even have to ask any questions?

Mr. BACKSTER. You don't need to; no, sir. The question is not important. It is the topic that you touch on at that given time.

Mr. Moss. You just hook it up and start talking?

Mr. BACKSTER. It is not that easy, sir. This system described here has been used——

Mr. Moss. What do you do, read into it?

Mr. BACKSTER. No; you ask very set questions at periodical intervals but the questions all deal in terms of what the man is holding back from you. Not a question that has to be changed with every person and every topic you cover during the examination.

Mr. Moss. The applicant, therefore, is not put through the humiliating process of being grilled such as he would be in a lie detector test. Indeed, he need not speak a word during the entire electronic evaluation procedure. Just the mention of particular topics such as a past arrest will cause a reaction on the machine so that the examiner knows the man is disturbed about the question.

What do you do, just read a list of questions to him, then?

Mr. BACKSTER. That is right, you do that with the proper time interval in between and the association response or the disturbance in the area and the question asked is very indictive.

Mr. Moss. Is there variation in the response of a person's ebb and tide of blood pressure. Between individuals, do they all have the same time lapse between and up and down?

Mr. BACKSTER. No, sir; there is quite a variation.

Mr. Moss. Quite a variation; isn't there?

Mr. BACKSTER. Yes.

Mr. Moss. Not necessarily reliable, then, taken through a series.

Mr. BACKSTER. If the length of the test exceeds, I would say, 3½ to 4 minutes, the arm discomfort factor enters into the situation and the pain factor would distort the pattern to the extent that we would not consider it reliable in reading the areas of the questions.

Mr. Moss. Then this article is not accurate?

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Mr. BACKSTER. It is not the most accurate article, sir.

Mr. MOSS. At all.

Mr. BACKSTER. I wouldn't say it is not accurate at all. There is a great deal that is accurate about it.

Mr. MOSS. It is not accurate in describing the instrument.

Mr. BACKSTER. It leaves off the breathing tracer; yes, sir.

Mr. MOSS. It really is, then, a polygraph.

Mr. BACKSTER. Sir, the equipment that was designed for this was turned over to the company concerned and became the standard polygraph design. I am the person who designed the component equipment feature to start with.

Mr. MOSS. I raise the questions because you are the one that handed me this.

Mr. BACKSTER. Yes, sir; I thought it would be helpful. But maybe I was wrong.

Mr. MOSS. If there is no objection this reprint, "Bus Transportation of November 1956," which has just been discussed, will be inserted in the record. (See exhibit 2C, p. 142.)

Mr. MOSS. Do you use a mirror in your laboratory when you are interrogating subjects?

Mr. BACKSTER. Ordinarily I do not. There is not occasion to. I do have the facility available for training purposes, particularly if it is needed.

Mr. MOSS. Not for training purposes. I am not interested in that at the moment. I was asking when you had a subject under examination.

Mr. BACKSTER. This could also be instruction for a trainee examiner to observe an actual test in operation.

Mr. KASS. Mr. Backster, are you familiar with this Popular Science reprint of September 1963? (See exhibit 2B, p. 138.)

Mr. BACKSTER. Yes, sir.

Mr. KASS. Is the polygraph laboratory displayed here the polygraph laboratory of your school or your laboratory?

Mr. BACKSTER. Yes, sir. (See exhibit 8, p. 188.)

Mr. KASS. Could you describe what these various panels are?

Mr. BACKSTER. Yes, sir. The various panels are actual trays that primarily hold objects. They are painted white, and have a mirror over them, which is a 45° angle mirror and individually controlled lighting over each of the eight little bins concerned.

When we run a peak of tension tests where we have objects to put in these bins one of the objects may be the weapon used in the murder case and each of the other bins would contain a weapon of a different caliber or make of gun where the person that was not involved in the crime would make no distinction among the weapons concerned and would show no disturbance or rise that is significant.

A person that was involved would show very strong response as he built up to the booth that lighted showing his weapon that he knew he used in the crime and it would enhance greatly our response.

Mr. KASS. This is used in what you call the peak of tension test?

Mr. BACKSTER. Yes, sir. There is also a secondary purpose for this mirror. It is specially coated so that it can be utilized from the back side as an observation post.

Mr. KASS. Then this is a two-way mirror system described earlier by Mr. Lindberg?

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Mr. BACKSTER. This is not the same system.

Mr. KASS. But it is a two-way mirror system?

Mr. BACKSTER. Yes.

Mr. KASS. And, therefore, people can sit on the other side and observe a test which is going on in this particular interrogation room described in this article?

Mr. BACKSTER. Yes.

Mr. MOSS. Do you take these people into the room when you give them the polygraph test and you flash these various weapons on these lighted trays?

Mr. BACKSTER. If it is a murder case and we have the weapon, sir. In fact the murder case on the day that Mr. Kass visited——

Mr. MOSS. It sounds to me like this borders on a certain amount of entrapment in a thing like that. Are some people disturbed by guns whether or not they have used them?

Mr. BACKSTER. Sir, this is an example of its use. I am giving you an example of a gun that has been recovered in a murder case and shown to the individual. We do not have objects in those trays during the ordinary examination that doesn't involve a peak of tension test.

Mr. MOSS. Might it be an item that was supposed to have been stolen other than a weapon?

Mr. BACKSTER. Not usually in the lesser intense cases.

Mr. MOSS. Might it be any item that might have association with a line of questioning?

Mr. BACKSTER. Yes, that has a special meaning to the person who is wrong.

Mr. MOSS. In setting up for the Government have you established any laboratories of this type for the Government?

Mr. BACKSTER. No, sir.

Mr. MOSS. At Fort Gordon?

Mr. BACKSTER. This is the first and only one in the country, sir.

Mr. MOSS. Is this part of a technique that you urge upon your trainees?

Mr. BACKSTER. No, sir.

Mr. MOSS. What is this, a pioneering technique that you are trying to develop?

Mr. BACKSTER. It is a pioneering technique, yes, and it allows for quite a realistic observation of the actual case as it unfolds before you.

Mr. MOSS. Sort of a pretrial trial?

Mr. BACKSTER. I don't think so, sir. In fact this is the first adverse comment I have had on it.

Mr. MOSS. I would venture to say, Mr. Backster, it shall not be the last.

Mr. BACKSTER. I imagine so.

Mr. MOSS. I want counsel to develop some questions on your background of association with the Government and then I think that will conclude the hearings for today.

Mr. KASS. Mr. Backster, are you familiar with the Academy for Scientific Interrogation?

Mr. BACKSTER. Yes, sir; I am.

Mr. KASS. Are you familiar with this newsletter from the academy of March and April, apparently 1963? (See exhibit 2D, p. 146.)

Mr. BACKSTER. Yes, sir; I am familiar with that.

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Mr. KASS. What is your relationship with the Army Polygraph School at Fort Gordon, Ga.?

Mr. BACKSTER. The relationship is no direct one as such, although they have attempted and have actually utilized each of the basic techniques that were popularly in use within the field of polygraph and have sent individuals to work conferences or advanced courses that we have conducted at the school in New York.

As such they have attempted and have done a good job in putting these techniques to work down at their own school, at first on a trial basis and then after a certain degree of validation have attempted to standardize on the technique that they felt was most beneficial.

Mr. KASS. Have they in fact adopted what you would describe as the Backster zone comparison technique which you described to the committee this afternoon and this morning by slides?

Mr. BACKSTER. They, I understand, favor that, sir. They teach all the techniques but favor the zone comparison one.

Mr. KASS. Are you familiar with this reprint?

Mr. BACKSTER. Yes, sir.

Mr. KASS. I believe you are an officer of the Academy.

Mr. BACKSTER. Yes, sir.

Mr. KASS. It is stated in here that Cleve Backster's finally completed standardized polygraph note pack and technique were adopted by the Army school. From what I understand you have just said, they didn't adopt it, they just merely accepted it among other techniques.

Mr. BACKSTER. I might say that they feature it, sir. They perhaps spent more time on that. I understand, sir, that for five classes they taught each class the Backster technique and also the John Reid technique, and had the students use both through the first half of the class. In each of these they gave the student the choice to complete his theoretical problem during the last half of the course using either of the techniques that he thought would most beneficially produce for him in their casework.

Within five classes I understand that not one person used other than zone comparison, by his own choice.

Mr. KASS. Zone comparison. Would you identify that for the record?

Mr. BACKSTER. Zone comparison is the test that I propose as a standard.

Mr. KASS. I see. The next sentence of this newsletter states:

This is going to be used exclusively by the school and they hope to have all examiners of the Army return to Fort Gordon Lie Detection School for work conferences and instruction on Cleve's—

I assume Cleve is Mr. Backster—

standardized note pack and polygraph technique so that it could be used by the Army.

Could you comment on that?

Mr. BACKSTER. Yes, sir. I think they have already had two of these advanced courses where examiners have been returned to specialize in this technique. I think eventually they hope to have more.

Mr. KASS. Do they return to your school in New York?

Mr. BACKSTER. No, sir; they return to Fort Gordon.

Mr. KASS. Do you ever go to Fort Gordon, Ga., for conferences?

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Mr. BACKSTER. This is the only time I have gone down to Fort Gordon. The rest of the occasions they have had representatives attend the school in New York or I have conducted a work conference in the same place that one of their people were attending a work conference.

Mr. Moss. Have you had Army contracts?

Mr. BACKSTER. Army contracts, sir?

Mr. Moss. Yes.

Mr. BACKSTER. No.

Mr. Moss. Either as a consultant?

Mr. BACKSTER. I have had consultant arrangements. A personnel contract.

Mr. Moss. Yes; have you had a working agreement with the Government with the Department of Army where they have paid you money for your services?

Mr. BACKSTER. Yes; by the day; yes, sir.

Mr. Moss. For how long a period of time?

Mr. BACKSTER. May I look at my records? I can probably tell you accurately in a minute.

Mr. Moss. Yes; I will tell you in order to shorten the hearing, we will hold the record and you will supply the staff with the contracts, their duration and the amounts involved.

Mr. BACKSTER. I will be glad to.

(The contracts are to be found in subcommittee files.)

Mr. KASS. Mr. Backster, have you had contracts with any other Government agency?

Mr. BACKSTER. Other than what, sir?

Mr. KASS. Other than the Army.

Mr. BACKSTER. Yes, sir.

Mr. KASS. Could you identify for the record these agencies?

Mr. BACKSTER. I have been a consultant with National Security Agency, Physical Security Equipment Agency, when it was in existence, and directly to the Office of the Secretary of Defense.

Mr. KASS. Were these——

Mr. BACKSTER. In the Air Force, sir; I am sorry.

Mr. KASS. Could we hold the record at this point to identify these contracts for the record?

Mr. Moss. Yes.

Mr. KASS. Have you had any contact with the Central Intelligence Agency?

Mr. BACKSTER. I was a full-time employee of that Agency, sir.

Mr. KASS. During what years?

Mr. BACKSTER. During the years—may I check my permanent records?

Mr. Moss. Again, you can supply that for the record.

Mr. BACKSTER. All right.

Mr. Moss. The staff can meet with you following this session this afternoon and you can supply from your records that information, or if you require other records in order to complete it, you will obtain those and return them to the committee as quickly as possible.

Mr. BACKSTER. I will be glad to.

Mr. KASS. Mr. Backster, this was approximately before 1950; is that correct?

Mr. BACKSTER. This was before 1950; yes, sir.

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Mr. KASS. Did you help set up the polygraph technique and training program at the Central Intelligency Agency?

Mr. BACKSTER. Yes, sir; I did.

Mr. KASS. Mr. Backster, you informed Congressman Reid earlier that you were not, I believe you used the word, you had no independent knowledge of the Delaware State Police percentage of individuals who were not eligible for employment.

Mr. BACKSTER. I have that up in New York I am sure.

Mr. KASS. You have no independent knowledge. In other words, here in this room you have no independent knowledge?

Mr. BACKSTER. Not here, I don't.

Mr. KASS. Could you give us a rough guess as to how many individuals were not employed by the Delaware State Police on the basis of the polygraph exam?

Mr. BACKSTER. No, sir. I can if you want, but it will be out of the air. I don't have the foggiest idea what percentage was involved.

Mr. MOSS. He can supply it for the record.

Mr. KASS. Mr. Backster, you answered Mr. Moss earlier that if he were being subject to a polygraph exam and at a particular moment when you asked a certain question, if I were thinking how ridiculous a procedure this was, for example, that this would be ideal or good in the event that he would think this continuously throughout the exam; is that correct?

Mr. BACKSTER. If he were to think it continuously during that particular block that involved the earlier-in-life question. If he were consistent in his being able to concentrate and his psychological set would allow him to divert from that which could hurt him if he were wrong and would allow him the triviality of enjoying that thought on the other type question, it would be a good indication that there was nothing seriously wrong on the relevant question.

Mr. KASS. If he did not continuously think this and suddenly switched to another thought, would that affect your reading of the polygraph chart?

Mr. BACKSTER. If it were the thought of approximately the same intensity it may show up about the same size.

Mr. KASS. What if it were not of the same intensity?

Mr. BACKSTER. It would not matter if there was a lack of response on the opposite type question asked.

Mr. KASS. So, in any case, whatever Mr. Moss or the subject in that particular case thought, it would not make a difference in your reading the chart?

Mr. BACKSTER. It may produce an extraneous response by which we are not bothered if we concentrate on the lack of response rather than presence of response in interpreting the chart.

Mr. KASS. Does the school at Fort Gordon teach this particular method?

Mr. BACKSTER. Yes; I believe they do. This is the basis of the whole technique.

Mr. MOSS. As long as you are talking about me, Mr. Backster, over the course of many years sitting in hearings not always as lively as these, I have sort of developed the defensive habit of wandering in my thoughts and sometimes finding an opportunity to amuse myself by

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recollection, or maybe a little mental note on something that is happening that I find pleasant or unpleasant.

I imagine many people do this. I think it might not have a sudden pattern that I suddenly had a quick thought that was a ridiculous procedure. I assure you I would not continue to hold it. I might jump to something else.

Mr. BACKSTER. That, sir, is very possible. In fact, we carefully review the questions word for word several times to take the edge off such feelings as that. Also, we invite the person to reflect any thoughts that they have if they feel that the question is inadequate. They can help to groom the question. After that is completed in asking the question we will repeat the question throughout several charts where we get a frequency of times where the subject is exposed to that same question which certainly makes insignificant one or two times when there has been a sporadic thought.

Mr. KASS. Mr. Backster, I have one final question. You spoke earlier in answer to Chairman Moss, I believe, of the "stigma" of the polygraph industry. Could you explain what you meant by his.

Mr. BACKSTER. In what framework is that used?

Mr. KASS. In the framework, I believe, in an article in Bus Transportation.

Mr. MOSS. That was the article of Mr. Reuss.

Mr. KASS. The "Electronic Marvel Weeds Out Dishonest and Unfit Applicants."

Mr. BACKSTER. Yes, sir.

Mr. KASS. In answer to a question why you were not hooked up on the breathing you referred to the stigma of the polygraph industry.

Mr. MOSS. You used "stigma" in the sense of identifying in that particular illustration the attachment of some device for measuring respiration. You only had the two little rings on your finger and you referred to it as a stigma.

Mr. BACKSTER. I don't know what framework in which I was thinking that. The thing I was attempting to portray is that the breathing attachment of the conventional type, the heavy type breathing attachment, would look more frightening perhaps than it really should. In fact, the employer was the one that was apprehensive about these tests and not the employee.

Mr. MOSS. Now, I would ask that you also supply for the record as quickly as possible a complete summary of your background and qualifications, including any academic training that you have taken.

Mr. BACKSTER. I would be glad to do so. (See exhibit 4A, p. 162.)

Mr. MOSS. That completes the committee's requirement for your presence and you will have satisfied the request for your appearance when the material requested for the record has been supplied.

The committee will adjourn until 10 o'clock tomorrow morning when it will reconvene in room 1501 in the Longworth House Office Building.

(Present at the time of adjournment: Mr. Moss.)

(Whereupon, at 5:30 p.m., the subcommittee recessed, to reconvene at 10 a.m., Friday, April 10, 1964.)

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APPENDIXES

EXHIBITS 1A–1H—STATE STATUTES AND CODES RELATING TO POLYGRAPHS AND OTHER LIE DETECTION DEVICES

EXHIBIT 1A—ILLINOIS

(SMITH-HURD, ILLINOIS STATUTES, ANNOTATED, TITLE 38, SEC. 951 ET SEQ.)

AN ACT To provide for licensing and regulating detection of deception examiners, and to make an appropriation in connection therewith

Be it enacted by the people of the State of Illinois, represented in the General Assembly:

SECTION 1. As used in this Act, unless the context otherwise requires: "Detection of Deception Examiner," hereinafter referred to as "Examiner" means any person who uses any device or instrument to test or question individuals for the purpose of detecting deception.

"Internship" means the study of detection of deception and the administration of detection of deception examinations by a trainee under the personal supervision and control of an examiner in accordance with a course of study as prescribed by the Department at the commencement of such Internship.

"Person" includes any natural person, partnership, association, corporation or trust.

"Department" means the Department of Registration and Education of the State of Illinois.

"Director" means the Director of the Department of Registration and Education of the State of Illinois.

"Committee" means the Detection of Deception Examiner Committee provided for in this Act.

"Him" means both the male and female gender.

SEC. 2. The practice of the detection of deception in the State of Illinois is declared to affect the public health, safety and welfare and is subject to regulation and control in the public interest.

SEC. 3. Every examiner shall use an instrument which records permanently and simultaneously the subject's cardiovascular and respiratory patterns as minimum standards, but such an instrument may record additional psychological changes pertinent to the detection of deception. An examiner shall, upon written request of a person examined, make known the results of such test to the person examined within 5 days of receipt of the written request.

SEC. 4. It is unlawful for any person to administer detection of deception examinations, or attempt to hold himself out as an Examiner, without a license issued by the Department, except insofar as qualified by sections 5 and 12 of this Act. *Provided, however,* That this shall not prohibit the use of detection of deception equipment by a person licensed to practice medicine in all its branches under the Medical Practice Act of Illinois when the results are to be used in research.

SEC. 5. Any person may administer detection of deception examinations in this State without license for not to exceed twenty days during any calendar year. *Provided, however,* that any time prior to administering said examinations, such person shall pay a registration fee and file with the Department a sworn affidavit that said person—

(a) is a citizen of the United States; and

(b) is at least 21 years of age; and

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(c) has administered detection of deception examinations for a period of at least two years using the instrumentation prescribed in section 3 of this Act; and

(d) has not been convicted of a misdemeanor involving moral turpitude or a felony, or who has not been released or discharged under other than honorable conditions from any of the armed services of the United States.

The registrant under this section is subject to all the provisions of this Act relating to examiners except sections 6, 9, 11, 12, 13, 16, 26, and 30, and the Director shall deny, rescind, or revoke the registration of any person who at any time violated said provisions of this Act. The registration fee is nonrefundable.

SEC. 6. On the effective date of this Act, any person who has actually engaged in the occupation, business, or profession of an examiner before April 1, 1963, and who has used for that period the instrumentation prescribed in section 3, shall, upon application within one year after the effective date of this Act and payment of the required licenes fee, be issued a license hereunder, without examination, *provided, however*, that the Director may require such applicant to submit satisfactory proof that he has so engaged for such period.

SEC. 7. None of the powers, duties, or functions of the Department or the Director thereof under this Act shall be exercised except under the action and written report of the Detection of Deception Examiner Committee. Such committee shall be composed of five individuals appointed by the Director. The members of the committee shall have been engaged continuously in the State of Illinois for a period of at least five years as examiners. Three members must be actively engaged in the private, or commercial, practice of detection of deception and two members must be primarily engaged in the detection of deception for the State of Illinois or a county or municipality within the State of Illinois. Each member shall serve for a term of five years.

The action or report in writing of a majority of the committee shall be sufficient authority upon which the Director of Registration and Education may act. In designating the persons to act, the Director of Registration and Education shall give due consideration to recommendations by members of the profession and by organizations therein. Whenever the Director is satisfied that substantial justice has not been done in an examination, he may order a reexamination by the same or other examiners.

SEC. 8. Applications for original licenses shall be made to the Department in writing on forms prescribed by the Department and shall be accompanied by the required fee, which shall not be returnable. Any such application shall require such information as in the judgment of the Department will enable the Department to pass on the qualifications of the applicant for a license.

SEC. 9. The license of an examiner which has not been revoked or is not suspended shall be renewed annually upon payment of the required fee by the examiner.

SEC. 10. Each nonresident applicant for an original license or a renewal license, shall file an irrevocable consent that actions against the applicant may be filed in any appropriate court of any county or municipality of this State in which the plaintiff resides or in which some part of the transaction occurred out of which the alleged cause of action arose and that process in any action may be served on the applicant by leaving two copies thereof with the Director of the Department. Such consent shall stipulate and agree that such service of process shall be taken and held to be valid and binding for all purposes. The Director shall send forthwith one copy of the process to the applicant at the address shown on the records or the Department by registered or certified mail.

SEC. 11. A person is qualified to receive a license as an examiner:

A. Who is at least 21 years of age; and

B. Who is a citizen of the United States; and

C. Who establishes that he is a person of honesty, truthfulness, integrity and moral fitness; and

D. Who has not been convicted of a misdemeanor involving moral turpitude or a felony, or who has not been released or discharged under other than honorable conditions from any of the armed services of the United States; and

E. Who has passed an examination conducted by the Examiner Committee, or under its supervision, to determine his competency to obtain a license to practice as an examiner; and

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F. Who has had conferred upon him an academic degree, at least at the baccalaureate level, from a college or university accredited by the Department; and

G. Who has satisfactorily completed not less than six months of internship training.

SEC. 12. The Department shall issue an internship license to a trainee upon application and payment of the required fee which application shall contain such information as may be reasonably required by the Department.

An internship license shall be valid for the term of twelve months from the date of issue. The Department may renew or extend any internship license upon good cause shown for any term not to exceed twelve months.

SEC. 13. Each license shall be issued for the term of one calendar year or for such part thereof as remains at the time of the issuance thereof. Each license shall be renewed during the month of November of each year. Each license not renewed during November of each year shall expire on December 1, of that year. An examiner whose license has expired may be reinstated at any time within five years after the expiration thereof, by making a renewal application therefor and by paying the renewal license fee and all lapsed renewal fees for each year since the expiration of his license. However, any examiner whose license expired while he was (1) in Federal service on active duty with the Armed Forces of the United States, or the State militia called into service or training, or (2) in training or education under the supervision of the United States preliminary to induction into the military service, may have his license renewed, reinstated or restored without paying any lapsed renewal fees if within two years after honorable termination of such service, training or education except under conditions other than honorable, he furnishes the Department with satisfactory evidence to the effect that he has been so engaged and that his service, training or education has been so terminated.

A license or duplicate license must be prominently displayed at the principal place of business of every examiner. Each license shall be signed by the Director and shall be issued under the seal of the Department.

Notice in writing shall be given to the Department by such license holder of any change of principal business location whereupon, the Department shall issue a new license for the unexpired period upon payment of the required fee. A change of business location without notification to the Department and without the issuance by it of a new license shall automatically suspend the license theretofore issued.

SEC. 14. The Department may refuse to issue or may suspend or revoke a license for any one of the following grounds:

A. Material misstatement in the application for original license or in the application for any renewal license under this Act.

B. Wilful disregard or violation of this Act or of any regulation or rule issued pursuant thereto.

C. Conviction of a felony or a misdemeanor involving moral turpitude.

D. Making any wilful misrepresentation or false promises or causing to be printed any false or misleading advertisement for the purpose of directly or indirectly obtaining business or trainees.

E. Having demonstrated incompetency to act as an examiner as defined under this Act.

F. Allowing one's license under this Act to be used by an unlicensed person in violation of the provisions of this Act.

G. Wilfully aiding or abetting another in the violation of this Act or of any rule issued by the Department pursuant thereto.

H. Where the license holder has been adjudged mentally ill, mentally deficient or in need of mental treatment as provided in the Mental Health Code.

I. Failing, within a reasonable time, to provide information requested by the Department as the result of a formal or informal complaint to the Department, which would indicate a violation of this Act.

SEC. 15. Any unlawful act or violation of any of the provisions of this Act upon the part of any examiner or trainee, shall not be cause for revocation of the license of any other examiner for whom the offending examiner may have been employed, unless it shall appear that the examiner has wilfully aided or abetted the actions or activities of the offending examiner or trainee.

SEC. 16. The Department shall prepare annually a list of the names and addresses of all examiners and trainees and of all persons whose licenses have been suspended or revoked within the previous year, which list shall be mailed

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to the county clerk of each county of the State and be held by such county clerk as a public record.

SEC. 17. The Department may upon its own motion and shall upon the verified complaint in writing of any person setting forth facts which if proved would constitute grounds for refusal, suspension or revocation of a license under this Act, investigate the actions of any applicant or any person or persons holding or claiming to hold a license. The Department shall, before refusing to issue and before suspension or revocation of a license, at least ten days prior to the date set for the hearing, notify in writing the applicant for, or holder of a license, of the nature of the charges and that a hearing will be held on the date designated. The hearing shall determine whether the applicant or holder, hereinafter called the respondent is privileged to hold such license, and shall afford the respondent an opportunity to be heard in person or by counsel in reference thereto. Such written notice may be served by delivery of the same personally to the respondent at the address of his last notification to the Department. At the time and place fixed in the notice, the Committee shall proceed to hear the charges and both the respondent and complainant shall be accorded ample opportunity to present in person or by counsel such statements, testimony, evidence and argument as may be pertinent to the charges or to the defense thereto. The Committee may continue such hearing from time to time. If the Committee shall not be sitting at the time and place fixed in the notice or at the time and place to which the hearing shall have been continued, the Director shall continue such hearing for a period not to exceed thirty days, unless extended by stipulation of both parties.

SEC. 18. The Department, at its expense, shall provide a stenographer to take down the testimony and preserve a record of all proceedings at the hearing of any case involving the refusal to issue or the suspension or revocation of a license. The notice of hearing, complaint and all other documents in the nature of pleadings and written motions filed in the proceedings, the transcript of testimony, the report of the Committee and orders of the Department shall be the records of such proceedings. The Department shall furnish a transcript of such record to any person or persons interested in such hearing upon the payment therefor of 75 cents per page for each original transcript and 5 cents per page for each carbon copy thereof ordered with the original; provided that the charge for any part of such transcript ordered and paid for previous to the writing of the original record thereof shall be 25 cents per page.

In any case involving the refusal to issue or the suspension or revocation of a license, a copy of the Committee's report shall be served upon the respondent by the Department, either personally or by registered or certified mail as provided in this Act for the service of the notice of hearing. Within twenty days after such service, the respondent may present to the Department a motion in writing for a rehearing, which written motion shall specify the particular grounds therefor. If no motion for rehearing is filed, then upon the expiration of the time specified for filing such a motion, or if a motion for rehearing is denied, then upon such denial the Director may enter an order in accordance with recommendations of the Committee. If the respondent shall order and pay for a transcript of the record within the time for filing a motion for rehearing, the twenty day period within which such a motion may be filed shall commence upon the delivery of the transcript to the respondent.

SEC. 19. Any circuit or superior court or any judge thereof, either in term time or vacation, may, upon application of the Director or of the applicant or licensee against whom proceedings upon section 17 of this Act are pending, enter an order requiring the attendance of witnesses and their testimony, and the production of documents, papers, files, books, and records in connection with any hearing in any proceedings under that section. The court or judge may compel obedience to its or his order by proceedings for contempt.

SEC. 20. Any person affected by a final administrative decision of the Department may have such decision reviewed judicially by the circuit or superior court of the county wherein such person resides. If the plaintiff in the review proceeding is not a resident of this State, the venue shall be in Sangamon County. The provisions of the "Administrative Review Act", approved May 8, 1945, and all amendments and modifications thereof, and the rules adopted pursuant thereto, shall apply to and govern all proceedings for the judicial review of final ad-

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ministrative decisions of the Department hereunder. The term "administrative decision" is defined as in Section 1 of said "Administrative Review Act".

The Department shall not be required to certify the record of the proceeding unless the plaintiff in the review proceedings shall first pay to the Department the sum of 75¢ per page of such record. Exhibits shall be certified without cost.

SEC. 21. Upon the revocation or suspension of any license, the licensee shall forthwith surrender the license or licenses to the Department and if the licensee fails to do so, the Department shall have the right to seize the same.

SEC. 22. The Director, on the recommendation of the Committee, may issue regulations, consistent with the provisions of this Act, for the administration and enforcement thereof and may prescribe forms which shall be issued in connection therewith.

SEC. 23. No action or counterclaim shall be maintained by any person in any court in this State with respect to any agreement or services for which a license is required by this Act or to recover the agreed price or any compensation under any such agreement, or for such services for which a license is required by this Act without alleging and providing that such person had a valid license at the time of making such agreement or doing such work.

SEC. 24. If any person violates the provision of this Act, the Director may, in the name of the people of the State of Illinois, through the Attorney General of the State of Illinois, apply, in any court of competent jurisdiction, for an order enjoining such violation or for an order enforcing compliance with this Act. Upon the filing of a verified petition in such court, the court or any judge thereof, if satisfied by affidavit or otherwise that such person has violated this Act, may issue a temporary injunction, without notice or bond, enjoining such continued violation, and if it is established that such person has violated or is violating this Act, the court, or any judge thereof, may summarily try and punish the offender for contempt of court. Proceedings under this section shall be in addition to, and not in lieu of, all other remedies and penalties provided by this Act.

SEC. 25. An order or a certified copy thereof, over the seal of the Department and purporting to be signed by the Director, shall be prima facie proof thereof:

(a) That such signature is the genuine signature of the Director;

(b) That such Director is duly appointed and qualified;

(c) That the Committee and the members thereof are qualified to act.

SEC. 26. The fee to be paid by an applicant for an examination to determine his fitness to receive an examiner's license is $50.

The fee is to be paid for an examiner's renewal license is $25.

The fee to be paid for an internship license is $10.

The fee to be paid for a renewal internship license is $5.

The fee to be paid by an unlicensed examiner to be registered under the provisions of section 5 is $5.

The fee to be paid for the issuance of a duplicate license or a license indicating a change of address is $5.

The fee to be paid for the reinstatement of an examiner's license within five years of the lapse thereof shall be $5 and all of the lapsed renewal fees.

The fee to be paid for the restoration of a license which lapsed more than five years preceding the application for restoration shall be $50.

This section in regard to fees shall not apply to any examiner in the exculsive employment of the United States of America, the State of Illinois, any county, municipality, or political subdivision in this State, any department, bureau or agency of any of the foregoing, or any examiner thereof in the pursuit of his official duties.

SEC. 27. Should any one or more provisions of this Act be held invalid, such invalidity shall in no manner affect any of the other provisions hereof.

SEC. 28. Any person who violates any provision of this Act or any person who falsely states or represents that he has been or is an examiner or trainee shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not less than $25, nor more than $500 or imprisonment in the county jail for a term of not to exceed six months, or both. All fines under this Act shall inure and be paid to the county in which the prosecution is maintained.

SEC. 29. At any time after the suspension or revocation of any license, the Department may restore it to the accused person, upon the written recommendation of the Committee.

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SEC. 30. An applicant who is an examiner, licensed under the laws of another State or territory of the United States, may be issued a license without examination by the Department, in its discretion, upon payment of a fee of $50, and the production of satisfactory proof:

(a) That the applicant is at least 21 years of age; and

(b) That the applicant is a citizen of the United States; and

(c) That he is of good moral character; and

(d) That the requirements for the licensing of examiners in such particular State or territory of the United States were at the date of licensing, substantially equivalent to the requirements then in force in this State; and

(e) That the applicant had lawfully engaged in the administration of polygraph examinations under the laws of such State or territory for at least two years prior to his application for license hereunder; and

(f) That such other State or territory grants similar reciprocity to license holders of this State.

SEC. 31. Appropriation.

EXHIBIT 1B—KENTUCKY

SESSION LAWS OF KENTUCKY, 1963

CHAPTER 78

(S. B. 63)

AN ACT Relating to "Detection of Deception Examiners," for licensing and regulating same

Be it enacted by the General Assembly of the Commonwealth of Kentucky:

SECTION 1. As used in this Act, unless the context otherwise requires:

(1) "Detection of Deception Examiner," hereinafter referred to as "Examiner," means any person, other than on a trainee, who uses any device or instrument to test or question individuals for the purpose of detecting deception.

(2) "Trainee" means any person who administers detection of deception examinations under the personal supervision and control of an examiner.

(3) "Person" means any natural person, partnership, association, corporation or trust.

(4) "Department" means the Department of Public Safety of the Commonwealth of Kentucky.

(5) "Commissioner" means the Commissioner of the Department of Public Safety of the Commonwealth of Kentucky.

SEC. 2. Every examiner shall use an instrument which records permanently and simultaneously the subject's cardiovascular and respiratory patterns as minimum standards, but such an instrument may record additional physiological changes pertinent to the detection of deception.

SEC. 3. (1) No person shall administer a detection of deception examination, as set forth in Section 1 of this Act, or any imitation thereof, without first securing a trainee's license or an examiner's license. Each application for a trainee's license shall be made to the department within ten days of the commencement of the trainee's internship, and said application shall contain such information as may be reasonably required by the department. The department shall issue the trainee license free of charge. Each application for an examiner's license shall be made to the department in writing on forms provided by the department and shall contain such information as is required by the department to determine the eligibility of the applicant. Each application for an examiner's license shall be accompanied by a fee of twenty dollars, which is nonrefundable.

(2) Each applicant for an examiner's license shall submit his fingerprints to the department together with a sworn affidavit that said applicant:

(a) Is a citizen of the United States;

(b) Is at least twenty-one years of age;

(c) Has administered detection of deception examinations for a period of at least two years using the instrumentation prescribed in Section 2 of this Act;

(d) Has completed a course of formal training in detection of deception in an institution accepted by the department; and

(e) Has not been convicted of a misdemeanor involvolving moral turpitude or a felony, or who has not been relased or discharged under other than honorable

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conditions from any of the Armed Services of the United States, or any branch of the state, city or federal government.

(3) Upon receipt of an application for a trainee's license or for an examiner's license, the commissioner shall investigate each application, and no license will be issued until said investigation is complete.

SEC. 4. On the effective date of this Act, any person who has actually engaged in the occupation, business or profession of an examiner for a period of five years, and who has used for that period the instrumentation prescribed in Section 2 of this Act, shall, upon application within one year after the effective date of this Act and upon payment of the required license fee, be issued a license hereunder, without completion of formal training in an institution; provided, however, that the commissioner may require such applicant to submit satisfactory proof that he has so engaged for such period and has the other qualifications of an examiner as are set forth in this Act.

SEC. 5. (1) Each examiner's license shall be issued for the term of one calendar year or for such part thereof as remains at the time of the issuance thereof. Each examiner's license shall be renewed during the month of December of each year, and each examiner's not so renewed shall expire on December 31, of that year. A renewal fee of fifteen dollars shall accompany each renewal application for the examiner's license.

(2) An examiner whose license has expired may, at any time within five years after the expiration thereof, obtain a renewal license by making a renewal application therefor and by paying a renewal license fee for each year since the expiration of his license; provided, however, any examiner whose license expired while he was (a) on active duty with the Armed Forces of the United States, or (b) called into service or training with the State Militia, or (c) in a training or education program under the supervision of the United States preliminary to induction into the military service, may have his license renewed without paying any intervening renewal license fee if within two years after termination of service, training or education, except under conditions other than honorable, he furnishes the department an affidavit to the effect that he has been so engaged and that his service, training or education has been so terminated. The commissioner shall, before issuing the renewal license, investigate each applicant during the expiration period.

(3) Each trainee's license shall be issued for the term of eighteen months. The department may renew or extend a trainee's license upon good cause shown for any term not to exceed eighteen months.

SEC. 6. (1) A license or duplicate license must be prominently displayed at each place of business of every examiner or trainee. The fee for a duplicate license is five dollars. Each license shall be signed by the commissioner and shall be issued under the seal of the department.

(2) Notice in writing shall be given to the department by such license holder of any change of principal business location whereupon, the department shall issue a new license for the unexpired period without charge. A change of business location without notification to the department and without the issuance by it of a new license shall automatically suspend the license theretofore issued.

SEC. 7. Each nonresident applicant for a trainee's license or examiner's license or a renewal license shall file an irrevocable consent that actions against the applicant may be filed in any appropriate court of any county or municipality of this Commonwealth in which the plaintiff resides or in which some part of the transaction occurred out of which the alleged cause of action arose and that process in any action may be served on the applicant by leaving two copies thereof with the commissioner of the department. Such consent shall stipulate and agree that such service of process shall be valid and binding for all purposes. The commissioner shall send forthwith one copy of the process to the applicant by registered or certified mail at the address shown on the records of the department.

SEC. 8. The department may deny, suspend or revoke any license on any one or more of the following grounds:

(1) Material misstatement in the application for a license or in the application for a renewal license.

(2) Wilful disregard or violation of this Act or of any regulation or rule issued pursuant thereto.

(3) If the holder of any license has been adjudged guilty of the commission of a felony or a misdemeanor involving moral turpitude.

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(4) Making any wilful misrepresentation or false promises or causing to be printed any false or misleading advertisement for the purpose of directly or indirectly obtaining business or trainees.

(5) Having demonstrated unworthiness or incompetency to act as an examiner or trainee, as defined under this Act, in such manner as to effect the interests of the public.

(6) Allowing one's license under this Act to be used by an unlicensed person in violation of the provisions of this Act.

(7) Wilfully aiding or abetting another in the violation of this Act or of any regulation or rule issued pursuant thereto.

(8) Where the licensed holder has been adjudged mentally ill, mentally deficient, or in need of mental treatment as provided in the Mental Health Code.

(9) Failing, within a reasonable time, to provide information requested by the department as the result of a formal or informal complaint to the department, which would indicate a violation of this Act.

SEC. 9. Any unlawful act or violation of any of the provisions of this Act upon the part of any examiner or trainee shall not be cause for revocation of the license of any other examiner for whom the offending examiner may have been employed, unless it shall appear to the satisfaction of the department that the examiner has wilfully aided or abetted the actions or activities of the offending examiner or trainee.

SEC. 10. The department shall publish, at least annually, a list of the names and addresses of all examiners and trainees and of all persons whose licenses have been suspended or revoked within that one year, together with such other information relative to the enforcement of the provisions of this Act as it may deem of interest to the public in the profession. One such list shall be mailed to the County Clerk of each county of the Commonwealth and shall be held by such County Clerk as a public record. Such list shall also be mailed by the department to any person in the Commonwealth upon request.

SEC. 11. The department may upon its own motion and shall upon the verified complaint in writing of any person setting forth facts which if proved would constitute grounds for denial, suspension, or revocation of a license under this Act, investigate the actions of any applicant or any person holding or claiming to hold a license. The department shall, before denial, suspension, or revocation of a license, at least ten days prior to the date set for the hearing, notify in writing the applicant or holder of a license of the nature of the charges and that a hearing will be held on the date designated. The hearings shall determine whether the applicant or holder, hereinafter called the respondent, is privileged to hold such license, and shall afford the respondent an opportunity to be heard in person or by counsel in reference thereto. Such written notice may be served by personal delivery to the respondent or by mailing the same by registered or certified mail with return receipt requested to the place of business last specified by the respondent on the records of the department. At the time and place fixed in the notice, the commisisoner shall proceed to hear the charges, and both the respondent and complainant shall be accorded ample opportunity to present in person or by counsel such statements, testimony, evidence and argument as may be pertinent to the charges or to the defense thereto. The commissioner may continue such hearing from time to time. If the commissioner shall not be sitting at the time and place fixed in the notice or at the time and place to which the hearing shall have been continued, the commissioner shall continue such hearing for a period not to exceed thirty days.

SEC. 12. (1) The department, at its expense, shall provide a stenographer to take down the testimony and preserve a record of all proceedings at the hearing of any case involving the denial, suspension or revocation of a license. The notice of hearing, complaint and all other documents in the nature of pleadings and written motions filed in the proceedings, the transcript of testimony, the report of the commissioner and orders of the department shall be the records of such proceedings. The department shall furnish a transcript of such record to any person interested in such hearing upon payment therefor of seventy-five cents per page for each original transcript and twenty-five cents per page for each carbon copy thereof ordered with the original: provided, however, the charge for any part of such transcript ordered and paid for previous to the writing of the original record thereof shall be twenty-five cents per page.

(2) In any case involving the denial, suspension or revocation of a license, a copy of the commissioner's report shall be served upon the respondent by the department, either personally or by registered or certified mail as provided in this Act for the service of the notice of hearing. Within twenty days after

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such service, the respondent may present to the department a motion in writing for a rehearing, which written motion shall specify the particular grounds therefor. If no motion for rehearing is filed then upon the expiration of the time specified for filing such a motion, or if a motion for rehearing is denied, then upon such denial the commissioner may enter an order in accordance with recommendations of the department. If the respondent shall order and pay for a transcript of the record within the time for filing a motion for rehearing, the twenty-day period within which such a motion may be filed shall commence upon the delivery of the transcript to the respondent.

SEC. 13. Any circuit court, either in term time or vacation, may, upon application of the commissioner or of the applicant or licensee against whom proceedings upon Section 11 of this Act are pending, enter an order requiring the attendance of witnesses and their testimony, and the production of documents, papers, files, books and records in connection with any hearing in any proceedings under that Section.

SEC. 14. Any person affected by a final administrative decision of the department may have such decision reviewed judicially by the Circuit Court of Franklin County.

SEC. 15. Upon the revocation or suspension of any license, the licensee shall forthwith surrender the license to the department, and if the licensee fails to do so, the department shall have the right to seize the same.

SEC. 16. If any person violates the provisions of this Act, the commissioner shall, in the name of the People of the Commonwealth of Kentucky, through the Attorney General of the Commonwealth of Kentucky, apply, in any court of competent jurisdiction, for an order enjoining such violation or for an order enforcing compliance with this Act. Proceedings under this section shall be in addition to, and not in lieu of, all other remedies and penalties provided by this Act.

SEC. 17. An order or a certified copy thereof, over the seal of the department and purporting to be signed by the commissioner, shall be prima facie proof thereof;

(1) That such signature is the genuine signature of the commissioner;

(2) That such commissioner is duly appointed and qualified; and

(3) That the commissioner and department thereof are qualified to act.

SEC. 18. Section 3(1), Section 5(1), and Section 6(1) of this Act, relating to fees charged applicants for a license, shall not apply to any department of the United States or any agency of the city, county or state of the Commonwealth of Kentucky provided that no fee is charged for administration of the test.

SEC. 19. Should any one or more provision of this Act be held invalid, such invalidity shall in no manner affect any of the other provisions hereof.

SEC. 20. Any person who violates any of the provisions of this Act shall, for each violation, be fined not less than twenty dollars nor more than five hundred dollars.

Approved March 9, 1962.

EXHIBIT 1C—NEW MEXICO

SESSION LAWS OF NEW MEXICO, 1963

Regular Session

CHAPTER 225, LAWS 1963

House Bill No. 341

AN ACT Relating to the Practice of Polygraphy; Providing for a licensing board; and establishing procedure for registration, qualification, and licensure

Be it enacted by the Legislature of the State of New Mexico:

SECTION 1. "Polygraphy" and "Practice of Polygraphy" defined. As used in this act:

A. "Polygraphy" means the recording of tracings of several different pulsations in the human body simultaneously for the purpose of determining veracity; and

B. "Practice of polygraphy" means the employment of any instrument designed to record simultaneously the physiological changes in human respiration, cardiovascular activity and galvanic skin resistance, or reflex, to determine veracity

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and to detect deception or the reading and interpretation of polygraph records and results.

SEC. 2. License to Practice Polygraphy. It is unlawful for any person to practice polygraphy, offer his services in the capacity of a polygrapher or purport to be a polygrapher without a liecense issued by the state board of examiners in polygraphy.

SEC. 3. Board of Examiners in Polygraphy. There is created a board of examiners in polygraphy to be comprised of three members to be appointed by the Governor for terms of three years: Provided, however, of the first board appointed, one member shall have a term of one year, one member shall have a term of two years and and one member shall have a term of three years. Any appointment to fill a board vacancy shall be for the unexpired term. Board members shall be qualified electors of New Mexico; one member shall be a licensed doctor of medicine; and two members shall be polygraphers actively engaged in the practice in New Mexico. The board shall meet annually in Santa Fe, upon a date to be set by resolution of the board, for the purpose of transacting business. The board members shall receive per diem and mileage as provided in the Per Diem and Mileage Act, and shall receive no other compensation, perquisite or allowance.

SEC. 4. Board Organization. Appointment of Registrar. Within sixty days of their appointment the board members shall meet and organize, designating one member president and one member registrar. The registrar of the board shall be ex-officio secretary-treasurer of the board and may receive payment, for service and remuneration for expenses in carrying out his necessary duties, in an amount to be determined by the board.

SEC. 5. Duties of Registrar—Records. The registrar of the board shall keep a registration book in which shall be entered the name of each licensee, date of license issue, address of licensee, record of fee payments and any other information concerning licensed polygraphers deemed necessary or desirable by the board. The registrar shall maintain a minute book recording all transactions of the board and shall keep financial records of disbursements and receipts in manner prescribed by the director of the department of finance and administration. The records of the board shall be maintained in Santa Fe.

SEC. 6. Applications for Registration and License. Persons seeking registration and licensing as a polygrapher shall make written application to the board of examiners in polygraphy, upon forms supplied by the registrar of the board. Application forms shall be designed and prescribed by the board to elicit all information necessary to determine whether an applicant is qualified to be examined as a polygrapher.

SEC. 7. Fees—Renewals—Suspension and Revocation. Each application for registration and license shall be accompanied by a fee of one hundred dollars ($100) payable to the state board of examiners in polygraphy. This initial fee is not refundable and shall cover the costs of processing the application; and it shall include, for successful candidates, the annual license fee for the year following registration and licensing. On or before July 1 of each year, every registered and licensed polygrapher shall transmit to the registrar a renewal fee of fifty dollars ($50.00) accompanied by the person's name, address, and registration number, and he shall receive therefor a renewal license certificate. A license granted by the board shall be automatically suspended if the holder fails to apply for renewal within a period of three months after July 1 of each year. Any suspended license may be restored by the board upon payment of a fee of fifty dollars ($50.00) in addition to the unpaid renewal fee. Failure to renew a license within one year from the date of suspension shall cause the license to be automatically revoked.

SEC. 8. Qualifications for Licensing and Registration. To be eligible and qualified for registration and licensing as a polygrapher, a person shall:

A. have attained the age of twenty-five years;

B. be a citizen of the United States;

C. be a graduate of a high school or have completed an equivalent course of study, as determined by an examination conducted by the state board of education;

D. be of good moral character; and

E. successfully pass examination by the state board of examiners in polygraphy.

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SEC. 9. Examinations. The state board of examiners in polygraphy shall, by examination, or by such other means as it shall deem advisable, determine whether each applicant for registration and license possesses the necessary knowledge and skill required to practice polygraphy in New Mexico.

SEC. 10. Refusal to License—Suspension and Revocation. The state board of examiners in polygraphy may refuse to issue a license or, if a license has been issued, may suspend or revoke the license of any person found, by the board:

A. to have been convicted of a crime involving moral turpitude;

B. to have made false representations to the board for the purpose of securing registration and license;

C. to be chronically or persistently inebriate or addicted to drugs;

D. to have been adjudged incompetent or insane;

E. to have been guilty of unprofessional conduct; or

F. to be incompetent.

SEC. 11. Unprofessional Conduct. Unprofessional conduct consists of those acts, determined by the state board of examiners in polygraphy, to be inconsistent with the public welfare, and shall include conduct tending to deceive or defraud, obtaining fees by misrepresentation, charging unusual, unreasonable or exorbitant fees, fee "splitting," and spurious advertising.

SEC. 12. Deposit and Use of Funds. All funds received by the registrar are to be deposited with the state treasurer to be credited to the "state board of examiners in polygraphy fund." The funds shall be used solely for the administration of registration and licensing procedures conducted by the state board of examiners in polygraphy.

SEC. 13. The state board of examiners in polygraphy is empowered to promulgate rules and regulations it shall deem necessary or desirable. The board may obtain the assistance of the attorney general to obtain necessary legal assistance. The board may expend the sums from the state examiners in polygraphy fund in accordance with annual budgets approved by the department of finance and administration. All expenditures shall be made upon vouchers signed by the registrar of the board.

SEC. 14. Any person who violates any provision of this act is guilty of a misdemeanor.

Approved March 21, 1963.

EXHIBIT 1D—ALASKA

LAWS OF ALASKA, 1964

CHAPTER 36

AN ACT Relating to examinations in which polygraphs or other lie-detector devices are used

Be it enacted by the Legislature of the State of Alaska:

SECTION 1. AS 23.10 is amended by adding a new section to article 1 to read:

SEC. 23.10.037. Lie-Detector Tests. (a) No person either personally or through an agent or representative may request or suggest to a person in his employ or to a person who has an application for employment pending before him or require as a condition of employment that the employee or applicant submit to an examination in which a polygraph or other lie-detecting device is used.

(b) The provisions of (a) of this section do not apply to the state or a political subdivision of the state when dealing with policemen in its employ or with persons applying to be employed as policeman.

(c) In this section "person" includes the state and a political subdivision of the state.

(d) A person who violates this section is guilty of a misdemeanor and, upon conviction, is punishable by a fine of not more than $1,000, or by imprisonment for not more than one year, or by both.

Law without signature April 2, 1964.

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EXHIBIT 1E—CALIFORNIA

Chapter 1881 of *Statutes and Amendments to the Codes, California*, 1963, page 3866, reads as follows:

SECTION 1. Section 432.2 is added to the Labor Code, to read:

"432.2. No employer shall demand or require any applicant for employment or propective employment or any employee to submit to or take a polygraph, lie detector or similar test or examination as a condition of employment or continued employment. The prohibition of this section does not apply to the federal government or any agency thereof or the state government or any agency or local subdivision thereof, including, but not limited to, counties, cities, cities and counties, cities, district, authorities, and agencies."

EXHIBIT 1F—ILLINOIS

SMITH-HURD STATUTES

TITLE 38

§ 736.2 Lie detector tests—Restrictions on court

In the course of any criminal trial the court shall not require, request or suggest that the defendant submit to a polygraphic detection deception test, commonly known as a lie detector test to questioning under the effect of thiopental sodium or to any other test or questioning by means of any mechanical device or chemical substance.

TITLE 110

§ 54.1 (Civil Practice Act, § 54.1). Lie detector tests—Limitations

In the course of any civil trial or pre-trial proceeding the court shall not require that the plaintiff or defendant submit to a polygraphic detection deception test, commonly known as a lie detector test or require, suggest or request that the plaintiff or defendant submit to questioning under the effect of thiopental sodium or to any other test or questioning by means of any chemical substance.

EXHIBIT 1G—MASSACHUSETTS

GENERAL LAWS ANNOTATED, 149

GENERAL PROVISIONS AS TO EMPLOYMENT

§ 19B. Lie detector tests; use as condition of employment; penalty

No employer shall require or subject any employee to any lie detector tests as a condition of employment or continued employment. Any person violating this section shall be punished by a fine of not more than two hundred dollars. Added St. 1959, c. 255.

Approved April 28, 1959.

EXHIBIT 1H—OREGON

Regular Session

CHAPTER 249, LAWS 1963

House Bill No. 1453

AN ACT Relating to lie detector tests as a condition for employment; and providing penalties

Be it enacted by the People of the State of Oregon:

SECTION 1. No person, or agent or representative of such person, shall require, as a condition for employment or continuation of employment, any person or employe to take a polygraph test or any form of a so-called lie detector test.

SEC. 2. Violation of section 1 of this Act is punishable, upon conviction, by a fine of not more than $500 or by imprisonment in the county jail for not more than one year, or by both.

Approved May 6, 1963.

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EXHIBITS 2A–2F—ARTICLES DEALING WITH THE USE OF POLYGRAPHS AND OTHER LIE DETECTION DEVICES

EXHIBIT 2A—UNCONSCIOUS MOTIVATION AND THE POLYGRAPH TEST

(By H. B. Dearman, M.D.[1] and B. M. Smith, Ph. D.[2])

(Reprinted from the American Journal of Psychiatry, vol. 119, No. 11, May 1963)

A young bank vice president was referred to the senior author by his employer, the president of the bank, because a lie detector examiner had alleged that the man had stolen money from the bank. A complete audit of the books had revealed no losses, and the president, expressing great confidence in his employee's integrity, wanted to "get to the truth of the matter." In the course of giving the client a complete medical, psychiatric, neurological, and psychological examination, a number of psychological, ethical, and possibly legal issues were raised.

The use of polygraphs (lie detectors) in research and in law enforcement situations is well known (7, 10) and need not be reviewed here, but our search of the literature has revealed a dearth of authoritative reports of their use in business operations. Business Week (2) describes the burgeoning of such services both by reputable detective agencies and by individuals. This article also raises questions as to the possible misuse of the technique by unethical "examiners" who are subject to no legal regulations (except in Massachusetts) and who may make claims far beyond the established limits of the procedure. The case reported here exemplifies the hazards of using a method that is not totally reliable even in the hands of the best trained personnel. The implication for the person who is a "false positive" are incalculable, but in the present case they could have cost him his job and could have made future employment difficult. In the case of suspected criminals, unwarranted sentences could be assessed. It was in view of the more extensive danger that this report is offered to a wider audience.

The most frequent uses of lie detectors in business are to screen job applicants and to examine employees periodically "to keep them honest." It was in a routine testing of employees that this client gave "positive evidence of lying" and was alleged to have stolen money.

The essential details of the case are here summarized:

The patient, a white, married, 27-year-old man was the only child of parents of average economic status. When he was 7, his parents were divorced (because the father drank too much), and he and his mother lived with her parents until he was 13 when the mother remarried. The boy and his stepfather did not get along very well, but he lived at home until he graduated, in the upper third of his class, from high school. He went to college primarily "to get away from home," flunked his first year, but settled down and earned his degree. In his second year of college he met the girl he was to marry 2½ years later. They have one child, He went to work for his present employer shortly after graduating from college and was rapidly promoted to vice president and manager of a branch bank.

On the occasion of the "routine" polygraph test by the examiner from the bank's detective agency, the patient showed a "violent" reaction to the question, "Have you ever stolen any money from the bank or its customers?" And positive responses to other questions concerning the bank. He also showed a positive reaction to the supposedly neutral question, "Do you drink coffee?" The patient was very upset by his failure to "clear the polygraph" and admitted to some minor misuse of bank funds, such as including parking fees on his expense account. The polygraph test was administered again, and again he "failed to clear." The patient confessed to the polygraph examiner that maybe his worry about personal problems, which he discussed with the interrogator, accounted for the positive reaction, so a third polygraph test was made. Again the interpretation was that the patient was lying and had stolen money. A final polygraph test was done in an effort to pinpoint the amount of money involved. The machine indicated that he showed peak reactions at $800 and at $1,100. The

[1] Formerly, chief resident psychiatrist, Department of Neurology and Psychiatry, University of Virginia School of Medicine. Present address: 208 East Watauga Street, Johnson City Tenn.

[2] Associate Professor, Department of Neurology and Psychiatry, University of Virginia School of Medicine.

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patient was thoroughly confused because he could not remember taking any such sums. However, since he had been convinced that he couldn't "fool the machine," he signed a confession that he had taken $1,000 and told how he must have done it. The books were audited, and it was discovered not only that he had not used the method that he had stated but that no shortage of that amount had occurred in his branch since he had been employed there.

As a result of this dilemma, the patient was referred for examination. In the course of the 7 hours of psychiatric examination (including a 2-hour sodium amytal interview) and subsequent psychotherapeutic interviews, the following relevant material emerged:

1. The patient had strongly ambivalent feelings toward his mother. She had divorced his father and 7 years later married a man with whom he did not get along. In the interim the patient felt neglected by his mother and developed positive feelings for his grandparents. He also felt that some of his mother's behavior toward him was somewhat seductive. 2. The patient's wife was 2 years his senior, and she had previously been married and divorced. His wife was very similar to his mother in many respects. 3. His wife and his mother were both "customers of the bank." 4. He had been involved in financial affairs with his wife and his mother to the extent of approximately $800 and $1,100 and about which he felt somewhat guilty. 5. In a number of instances he unconsciously identified wife with mother. His unconscious hostility for his mother was apparently the motivating force for a number of incidents (including wrecking her car and for which one of the sums mentioned above was involved).

It will be remembered that the question on the polygraph examination that evoked the most violent reaction was, "Have you ever stolen any money from the bank or its customers?" It seemed reasonable to assume that the patient was responding to the "customers" part of the question inasmuch as he identified his wife and mother as customers and inasmuch as he felt guilty about financial transactions that he had had with each of them.

In order to test this assumption, an independent polygraph examiner (a woman) was employed. She was given no background information prior to her examination of the patient. She was asked to give the exact questions used by the original interrogator and an additional set of five questions in which "bank," "customers of the bank," and "wife and mother" were separated.

This interrogator's interpretation of her findings prior to learning the background of the case was that the patient was lying and that he was guilty of theft. A careful examination of the polygraph records shows, however, that only in those questions in which the word "customers" appeared did the patient consistently show emotional reactivity on the polygraph record. On the basis of this evidence, it was concluded that the assumption made above of the patient's identification of wife-mother-customers was responsible for his emotional reaction.

It is interesting to note, however, that at the time of the polygraph examination, even though this material was conscious, it still evoked autonomic responses. It is of further interest that the positive response accompanying a truthful "yes" to the question, "Do you drink coffee?" was apparently due to his mother's prohibition of coffee during the patient's childhood.

The psychiatric diagnosis made for this patient was "acute anxiety reaction" and "adult situational reaction."

The case presented above illustrates the major problems involved in the practical application of the polygraph technique to the detection of deception. In the first place, the concept of "truth" is not easily defined; nor is the concept of "lying" any easier to clarify. Perhaps "truth" must be thought of in relative terms.

In crime detection the usual and obvious assumption of the investigator is that the suspect either did or did not commit the alleged act and that deviations in the autonomic responses reflect conscious deviation in his verbal statements from the "truth," as the "truth" is conceived by the examiner. Laboratory and field studies have shown that this assumption is not always valid. There are many variables other than "intent to deceive" that can produce the observed results. Some of the major variables will be discussed briefly, and the adequately trained, ethical polygraph operator must be aware of and take into consideration these factors in the conduct of his examination and interpretation of his records.

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There is evidence of constitutionl (biological) variability in automatic responsivity (8) "which may be at least partially an inherited characteristic." Other studies have demonstrated correlations between autonomic sensitivity and personality types and between autonomic sensitivity and various physical and psychosomatic illnesses (9, 14). An anxiety reaction is, in one major aspect, a hyperactivity of the autonomic nervous system.

Psychological factors other than conscious deception causing deviant autonomic responses include such situations or stimuli that produce frustration, surprise, pain, shame, embarrassment, etc. Some of these stimuli (e.g., startle and pain) are almost universal (though there are some exceptions), whereas others (frustration, shame and embarrassment) tend to be more idiosyncratic. The polygraph examiner may not, and the commercial operations usually do not, know enough about their clients to evaluate these idiosyncratic factors. This aspect is even more complex when the client is, himself, unconscious of the emotional quality of the stimuli.

Experiments in which polygraph recordings were taken during the administration of a word association test show that single words that have very personal (and often unconscious) meanings for the subject will produce deflections of the styli (5). Such an emotionally toned word embedded in a question could be responsible for a response that could be attributed to the question. Compound questions such as were used in the initial interrogation of this patient increase the possibility of misinterpretation of the record.

It has also been demonstrated (6) that learned emotional responses are retained in the autonomic system long after evidence from the voluntary system has dissipated.

The polygraph technique is a very useful research tool, but the courts are wise in their policy of not yet admitting evidence from such procedures. It is possible to get "false positives" and "false negatives." The possible harmful effects on an individual who happened to be a "false positive" cannot be calculated.

The moral and ethical problems related to the use of lie detection in business, and even in criminology, are much too complex to be dealt with in detail in this paper. It must be mentioned, however, that the standard procedure recommended by the proponents of this technique stresses that the subject be impressed with the idea that the machine can't be beat. The patient in the present instance had been so convinced of this infallibility that he confessed even though he was not guilty and consciously did not consider himself guilty. Thus, the examiner in effect uses deception in his effort to detect deception.

Another ethical question touches the concept of invasion of privacy. In our case the interrogator elicited private and personal information that was irrelevant to the sole purpose of the test, and his use of that information was ethically questionable. Supreme Court Justice Pierce Butler (3) made the following relevant comment:

It has always been recognized in this country, and it is well to remember, that few, if any, rights of the people guarded by fundamental law are of greater importance to their happiness and safety than the right to be exempt from all unauthorized arbitrary or unreasonable inquiries and disclosures in respect of their personal and private affairs.

As stated above, Massachusetts is the only State that has enacted legislation prohibiting the use of the polygraph examination as a condition of employment. The National Labor Relations Board (1961) prohibited the use of polygraph examinations to determine attitudes of prospective employees toward labor unions by a Washington, D.C. employer.

Summary and Conclusions

A case has been presented which illustrates some of the psychological, ethical, and possibly legal problems associated with the use of the polygraph examination (lie detector) in commercial establishments.

The polygraph technique only provides measures of various autonomic responses. The stimuli that elicit these responses, the intervening variables (constitutional predisposition, past learning, conscious and unconscious motivation, etc.) and the interpretations made of the resulting graphs are highly complex and are inferences made from more or less incomplete data. In any event, these instruments do not identify lying per se. The interpretation of the polygraph record is based on inferences of varying levels of remoteness. Inference

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is subjective; hence, polygraph examiners can, and do, make different interpretations of the same record.

It is our conclusion that the application of the polygraph technique as a lie detector is fraught with too many variables and sources of error for it to be used as it is currently being used in business and industry. Its use in criminal investigations and in other situations involving the commonweal (such as screening employees for sensitive Government positions) should be carefully and continually scrutinized, lest we find that George Orwell's 1984 is upon us.

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EXHIBIT 2B—DO LIE DETECTORS LIE?

WHILE THE DEBATE ABOUT THE LIE DETECTOR'S ACCURACY CONTINUES, WHERE DOES THIS LEAVE YOU IF YOUR JOB—OR LIFE—DEPEND UPON IT?

[Reprinted from Popular Science, September 1963, vol. 183 No. 3]

What are the chances that you'll be called a liar, a thief, a fraud, or a traitor by an instrument that can, in the hands of an unskilled or irresponsible examiner, make certain changes in your body seem to testify against you?

Better or—depending on how it's looked at—worse than you probably think.

For today, government, industry, and commerce all employ the lie detector to decide whether you'll get the job you want or stay in the one you already have. Under certain circumstances you may be requested to undergo an experience once reserved for the criminal suspect only.

Rank, position, or good reputation are no protection against the possibility of impeachment by polygraph (lie detector). This was demonstrated last April during the Washington controversy over the TFX aircraft contract. Pentagon investigators, trying to learn how the contents of an embarrassing document in the case reached a newspaperman, threatened the Secretaries of the Navy and the Air Force, the Deputy Secretary of Defense, and a number of prominent civilian and military officials, with lie-detector tests. President Kennedy intervened, saying, "I think it was a mistake to suggest a polygraph."

As long ago as 1895, Cesare Lombroso, an Italian criminologist, claimed that by taking a suspected man's blood pressure during police interrogation he could establish truth or deception.

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The late Dr. C. G. Jung, distinguished Swiss psychiatrist, thought there was a good deal to Lombroso's theory. Jung stated it as his conviction that the guilty could be detected with a "psychogalvanometer"—an instrument that visually indicates the skin's resistance to a very low electric current.

Early in this century, a Harvard psychology professor, Hugo Munsterberg, reported that a liar's own physiology would trap him in his deceit and attempts at evasion or falsehood. Others saw that there often existed a relationship between a man's deception and his rate of breathing and blood pressure changes.

The development and use of the polygraph quickly moved ahead after World War I. The 1920's, with their appalling increase in serious crime, provided an ideal laboratory for investigators.

The modern detector

One of the most noted polygraph examiners was Leonarde Keeler who, after majoring in psychology at Stanford University, joined the Berkeley, Calif., Police Department. There Keeler began to refine an instrument that simultaneously records a suspect's relative changes in blood pressure and respiration during interrogation. Keeler got remarkable results and, from the thugs he dealt with, astonishing confessions.

His hard-bitten customers could take a rubber-hose treatment far more successfully than they could cope with the mysterious and somehow sinister lie detector. It was a new kind of interrogative approach that didn't hurt until, having confessed, they heard what the judge had to say.

Keeler, this country's most noted pioneer in the field, can be credited with today's basic lie-detection equipment. In 1930 he founded his scientific crime detection laboratory at Chicago's Northwestern University with money donated by that city's businessmen.

Keeler called his apparatus a polygraph—Greek for "many writings."

The lie detector is not a machine, though it is often referred to as one. It is a combination of three instruments: a breathing-rate recorder, connected pneumatically to an attachment fitted around the subject's chest or stomach; a sphygmomanometer, a baglike rubber cuff connected to the "cardio" unit, that responds to variations in blood pressure and rate and strength of pulse; and a pair of metal contacts, attached to the hand or fingers, that evaluate relative changes in skin response.

All three readings are recorded on a roll of graph paper that unreels under three separate pens activated by impulses from the instruments.

The questioning

During a lie-detector test, the examiner asks the subject a number of questions, formulated to fit the case at hand. Some are designed to trigger an emotional reaction if deceptively answered or shied away from.

Some questions are neutral, innocuous, so commonplace that they can be answered without the graph showing evidence of emotional turbulence. Deliberately keyed for a nil reaction, they might be such queries as, "Is your last name Brown?" "Is your first name John?" "Were you born in the United States?"

The subject answers without any sense of stress. They excite no response. The polygraph examiner can read from the graph the lack of such responses on the chart.

But this is only the beginning.

Among the questions selected for lie-detector interrogation, there are several that are crucial, from which a reaction is expected if deception is attempted. Experience shows that even hardened liars find it virtually impossible to control their hidden emotions—though outwardly they may appear unaffected and impassive.

On the reaction to these crucial questions, a determination of deception or truth is made. Additional polygraph questions are now directed at the heart of the crime under investigation. "Did you kill your wife?" Did you yourself steal most or all of that missing $5,000?"

All questions, whether neutral or relevant, can ordinarily be answered by a plain yes or no. An interval is allowed between each question and its reply so that the polygraph can indicate the presence or lack of physiological response.

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How valid is it?

Here we reach an area where the debate about the lie detector's accuracy and the validity of its findings begins. Experts agree that the technique of questioning a subject, whether for criminal reasons or not, is vitally important. The questions asked and the manner in which they are asked exceed in importance what the breathing unit, cardio unit, and skin-response unit may be charting.

The lie detector is as open to abuse as any other instrument. Because it is associated with the search for deception, real or merely suspected, the subject is at a disadvantage. Moreover, there are polygraph examiners who are not as well-trained, experienced, or ethical as they should be.

In the hands of an untrained or unethical examiner, the lie detector is no better than a blackjack. Abuse, hostility, and expressed suspicion on an incompetent examiner's part can provoke reaction. But these reactions have no true meaning or value since they stem from a source other than the fear of detection.

Some subjects seemingly show no fear-of-detection response. The existence of such individuals was established recently in a murder case in the State of Washington.

Three men were involved, two of them under indictment for murder. The third man was the prosecution's chief witness. When a lie-detector test was run on the two charged with the crime, their reactions were not specific enough to justify an opinion. The response of the prosecution witness was negative throughout. He gave the examiner no reactions to read and so it was prematurely concluded that he was truthful.

Yet under later questioning, he admitted that he had been lying. He finally confessed that he—not the two men he was to testify against—was the murderer.

On the other hand, the polygraph, used properly, has yielded astonishing results.

One of the most dramatic instances was the Army Criminal Investigation Division's success in detecting deception and in securing a confession from Col. Jack Durant and Mrs. Durant that, while on occupation duty after World War II, they stole the crown jewels of the Duchy of Hesse. On another equally memorable occasion, Leonarde Keeler employed the polygraph technique to put his hands on eight Nazi POW's who had beaten a fellow prisoner to death.

Freeing the innocent

Credit must also be given the polygraph in the case of a young woman who accused a man of rape. Her story of the outrage was clear and circumstantial. Yet after examining the lie-detector chart of her reactions under interrogation, a police officer felt there was something wrong. His deduction was proved right; investigation revealed that the girl had invited the accused man to her home. When her husband arrived earlier than expected, she needed an excuse for her behavior—a good one and in a hurry. The polygraph in this instance saved an innocent man.

Police accomplishments of this magnitude have given the lie detector a reputation for near infallibility.

Polygraph examiners (who average $35 an examination) have a broad and seemingly lucrative field in which to exercise their specialty. It is estimated that there are currently 1,000 or more of them. Some are fly-by-nights intent on a fast and dishonest dollar.

One of the largest users is the U.S. Army Provost Marshal's Office. Some Federal agencies also employ the lie detector to check those suspected of being security risks. Many banks, commercial houses, and department stores—places where both temptation and opportunity for theft are present—use the lie detector in employee checks. One large firm reported that a polygraph screening of its help revealed that three out of every four workers admitted the theft of either goods or money—or both.

The lie detector has never been popular. This is scarcely surprising. For often its use may imply suspicion and distrust, without direct occasion for either. For example, if you want to get a job as a truck driver with certain bonded carriers, you must first be willing to take a polygraph examination. If you happen to get an incompetent examiner you may not get the job, and you'll wonder why.

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The mistakes

A number of question marks surround the entire procedure. Some are scientific, some are moral and ethical. Not infrequently the untrained or inexperienced examiner makes mistakes. Or, more correctly, the polygraph's "many writings" are erroneously interpreted. It takes experience, too, to recognize a "false positive" reaction from the innocent or a "false negative" one from the guilty.

Today's leaders in the field of scientific interrogation are keenly aware of the critical storm lie detection has provoked from eminent persons in government, law, and medicine. These men are as anxious to see reform as are any critics.

For example, Cleve Backster, head of New York City's Backster School of Lie Detection, and a man who for the last 16 years has been a consultant to various Government and law-enforcement agencies throughout the country, is especially emphatic in demanding that standards be raised. He estimates that an alarming percentage of U.S. polygraph examiners employ techniques that are obsolete.

"Hundreds of trained or semitrained examiners have entered the lie detection field," he contends. "Because of this we are confronted with an important decision. If we allow the present trend of polygraph misuse to continue, the result can be devastating. Our only alternative is to do everything possible to upgrade and standardize the many varieties of technique in current use."

Backster has worked tirelessly for better training, the use of more sophisticated instruments, and standards of proficiency that must be met before an examiner is licensed.

Acutely conscious that shysters and incompetents have given the polygraph a bad name, Backster has poineered new methods of evaluation. His fresh and more reliable techniques have been adopted by the U.S. Army's Fort Gordon Lie Detector School. They will now become standard procedure wherever Armed Forces detection tests are administered.

Should you take a test?

The question is often asked whether one should refuse to take a lie detector test. The best answer: It rests with you. It has been ruled legally that you do not have to take a test. A polygraph examination cannot be imposed on you without your consent. This would be a violation of your constitutional protection against self-incrimination. The old argument that "refusal is evidence of consciousness of guilt similar to evidence of flight" has been turned down by the courts.

And what do you do if the polygraph seems to say you are lying when in fact you are being truthful? Cleve Backster suggests: "Get in touch with the Research and Instrument Committee of the Academy for Scientific Interrogation (165 West 46th Street, New York City 36), to see if there is a record of the examiner receiving bona fide training and whether he is listed as a member of a reputable polygraph professional organization."

The moral seems to be: Choose your polygraph examiner as you would your personal physician.

Legal recognition of the validity and reliability of lie detector findings has not yet been won. The results of a polygraph examination are not admissible without prior stipulation in any of the country's courts.

Does all this mean that the instrument lies? No, because the polygraph reports truthfully the relative physiological changes taking place during questioning. That and nothing more.

At its best

Science still hestitates to give lie detection its blessing, principally because modern polygraph techniques that contain the necessary safeguards have not yet had widespread dissemination. What is reassuring is that lie detection by a skilled examiner utilizing the latest equipment has reached a level of accuracy that allows for consistent determination of the truth.

Today experts in the field are so confident that you can no longer fool a competent polygraph examiner that they universally advise: If you hope to deceive the polygraph, reconsider and avoid the examination. If, on the other hand, the truth will vindicate you, you'll find the polygraph a strong ally.

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EXHIBIT 2C—ELECTRONIC MARVEL WEEDS OUT DISHONEST AND UNFIT APPLICANTS

(Reprinted from Bus Transportation, November 1956)

TWO SMALL RINGS DETECT MINUTE PHYSIOLOGICAL CHANGES IN THE APPLICANT WHENEVER A DISTURBING TOPIC IS MENTIONED. INVENTOR CLEVE BACKSTER DEMONSTRATES HOW SIMPLE THE SETUP IS. TOPICS ARE MENTIONED OVER INTERCOM WHILE APPLICANT IS ALONE IN ROOM.

The wonderful world of electronics has finally come to the field of personnel hiring * * * and several bus companies have been among the first to cash in on the incredible possibilities it offers.

With a special machine known as the Backster electronic evaluator it's now possible for a personnel executive to find out, in 2 hours if necessary, just about everything of importance in the background of a prospective employee * * * not

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only those things which are actually on his record, but even, for example, cases of past dishonesty which nobody but he knows about.

In fact, by the time a job candidate finishes his testing, Backster evaluation men can predict whether or not he really plans to stay with you, the possibility of his becoming a personnel problem, and his accident probability. And all this is based not on what the man says or writes on his application form, but on what is actually in his mind.

If this all sounds like a Buck Rogers fantasy, remember that this is the age of electronic wonders, and anything can and does happen.

The man responsible for bringing electronic evaluation to the personnel field is Cleve Backster, who has yet to hit his 40th birthday, but is already recognized as an authority and consultant in the field of polygraph, or lie detector, work.

In the course of designing and improving psychological laboratory equipment, Backster conceived the idea of a completely new and extremely sensitive emotional response evaluator which could be employed with oral and written tests to screen the backgrounds of job applicants.

The Backster electronic evaluator resulted, after 10 years of research, but Backster points out emphatically that it is not a lie detector. An ordinary lie detector works essentially on the basis of relative changes in blood pressure, pulse rate, and pulse strength—it demands questions which can be answered yes or no, and depends on strong emotional "fear" responses on the part of the person being questioned.

With the Backster evaluator the technique used is entirely different. Through two little ring contacts placed on the fingers of the job applicant, it records extremely minute physiological changes which take place whenever a topic is mentioned which causes him any emotional disturbance whatsoever.

The applicant, therefore, is not put through the humiliating process of being "grilled," such as he would be in a lie detector test. Indeed, he need not speak a word during the entire electronic evaluation procedure—just the mention of a particular topic, such as a past arrest, will cause a reaction on the machine, so that the examiner knows that the man is disturbed about that question, and can then pinpoint just what it is that's disturbing him.

A number of bus companies are already using the Backster service, and have found it invaluable. For in an industry such as ours, where employees often handle money and are responsible for the safety of countless lives, everything you can know about the prospective employee is important.

Backster says that through his evaluator he can give a factual report to a company—a report which covers—

Past honesty—and undetected dishonesty;
Home life pressures affecting job performance;
Financial burdens;
Every place worked—and the real reason for leaving;
Every unemployed period—and why;
Military experience and courts martial;
Gambling and drinking habits;
Real reason for applying for the job;
Concealed mental or physical illnesses;
All arrests, including juvenile trouble; and
Actual education, training, and experience.

All this, remember, can be reported in spite of what the man originally puts on his application form—and in spite of what is on his official record.

As an example of how it works, we are reproducing on these pages an actual report made by Backster evaluation service on a man who applied to an intercity bus company for a driving job, and, prior to being tested by Backster, had tentatively been selected to join a training class.

As a result of the Backster screening, he and four others were considered too risky to hire. Although the ordinary credit-type check run by the bus company had failed to show up and derogatory information, the Backster evaluation showed a background definitely unsuited to the job of driving and handling money.

Only two out of an original seven proved acceptable risks—and the bus company was saved the tremendous expense of hiring and training men who would almost certainly have proved unsatisfactory.

Here's the way the Backster service worked out on one of the five applicants who was turned down. To protect the man and the company involved, all names have been changed, but everything else is exactly as it appeared in the report sent back to the bus company.

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First the man takes a written and oral "risk factor" test, then, if he signifies his willingness, the ring contacts are slipped on his fingers and he takes the electronic evaluation test. Actually, it has been found that even men who have something to hide are not only willing, but eager, to try this entirely new method of testing.

The examiner, who must be highly skilled in his work, then mentions a series of topics, after first telling the applicant the exact topics which will be covered.

As a result of this test, the man turned out to be a 90-percent general desirability risk, an 80-percent honesty risk, a 90-percent permanency risk, and a 40-percent risk in accident probability.

This is shown to the bus company in a quick chart form.

The reason the applicant was rated this way is the heart of the entire evaluation system.

By checking the "original test" portion of the graph pictured in this article it may be noted that on certain topics, such as physical ailments, mental sickness, and permanency intentions, the applicant's chart shows no rises. In other words, there was no emotional disturbance when those subjects were mentioned.

But going farther to the right of the chart, we see a high rise where the examiner mentioned his past employment history. Immediately the examiner knows that there is something here that bothers the applicant—something which merits further exploration. So he begins to cover topics which make it evident that he is aware of the disturbance—and almost infallibly he'll come up with the true story of the man's past employment.

Also pictured is a reproduction of a page from the examiner's report to the bus company, showing the applicant's actual employment record. Every job marked by an "o" was omitted from his application form with the bus company, while those marked with a "t" are jobs in which he falsified the time element in order to cover up periods of unemployment, dismissals with good cause, etc.

Now, how does the examiner know he has gotten the true story from the applicant. Check the bottom portion of the chart and you will see that the line barely wavers the second time he was asked about his past employment. He has told the examiner the true story, and now there is no more emotional disturbance to cause a rise in the graph.

Notice, too, that on the subjects of indebtedness, overdue debts and criminal arrests there are high spots on the upper chart which remain, although not quite so pronounced, on the lower chart. These mean that the examiner never could resolve all the man's troubles on those subjects—the applicant was still holding back something which he was not willing to reveal and so on the report a notation is made that on this particular subject there were "unresolved evaluator reactions."

This in itself might be considered damaging enough to the applicant to prevent his being hired, but as we'll see, it was hardly necessary to consider it all in this particular case.

Now let's look at some excerpts from the examiner's written report—excerpts which show why the man was considered an all-around bad risk as a future employee.

"*Residence data.*—Now separated from his wife and living with a friend. Intends to rejoin wife after birth of their sixth child. Address on your application is wife's parents' address.

"*Permanency intentions.*—Has application pending with Smith & Jones Trucking Co. Would prefer employment with your organization. No unresolved electronic evaluator reactions.

"*Marital status.*—Presently separated from his wife (did not check 'separated' on your employment application—has not been living with wife for more than 3 months. No unresolved electronic evaluator reactions.

"*Accident record.*—Has been a licensed driver for 13 years. Driver's license suspended for 1 year due to auto theft offense. (Refer to arrests.) In 1953 brakes failed and applicant's car hit another auto head on—sold his car without repairing—never paid other car's damages. Damaged fender of car which he had rented 6 or 7 weeks ago—misjudged distance and hit another car. Still owes rental company $30.

"*Indebtedness.*—$120 balance on finance company loan at $16 per month—4 months behind.

"$130 balance owed jewelry store at $20 per month—1 month behind.

"$80 balance on vacuum cleaner—several months behind on payments.

"$35 balance on clothing store account at $10 per month—5 months behind.

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"$30 balance owed car rental company.

"$120 in back rent owed landlord. Five months behind. Exhibits electronic evaluator reaction whenever this subject is touched upon. In the opinion of the examiner, applicant is still withholding information.

"*Use of alcoholic beverages.*—Presently drinks beer to medium extent. Used to drink rather heavily while in service. Drank on job with R. & N. Bus Co. (on charters).

"*Past employment termination.*—New Jersey Shipyard—discharged for nonpayment of union dues.

"R. & N. Bus Co.—discharged for deserting bus and having a 'last fling' on a summer run to Atlantic City.

"Kirby Meat Co.—discharged for misappropriating $350—has agreed to make restitution * * * hasn't been in touch with them since December 1954. (Route salesman for them * * * family bills pressing him * * * admits taking the money.)

"Milton Detective Agency—discharged when they learned of his police record.

"U.S. Navy—discharged 'under honorable conditions.'

"*Arrests.*—1943—Jersey City. Auto theft—1 year probation—license suspended for 1 year.

"1949—Two Navy summary courts martial for being absent over leave. Fined and restricted to ship.

"1949—U.S. Navy. General court martial for being AWOL 18 days and missing ship. Sentenced to 18 months in Philadelphia Naval Prison. Served 6 months, released on probation. Probation revoked after 6 months. Served another 6 months in prison.

"1951—Fall River, Mass. Auto theft, in jail overnight. Still in Navy at the time. First offense in Massachusetts, got $220 fine.

"1952—Union City, N.J. Stole wristwatch from girl and hocked it. Got 2 years probation.

"1954—Jersey City. Drunk and disorderly—in jail 2½ weeks. Examined by court psychiatrist and released as sane. (Demolished apartment while drunk.)

"Exhibits electronic evaluator reactions when this topic is touched upon. In the opinion of the examiner, applicant is still withholding pertinent information on arrests.

"*History of employee dishonesty.*—While working for R. & N. Bus Co. used to keep overages. Has given wife 'collected tickets' to use for transportation to Atlantic City. Exhibits electronic evaluator reactions whenever this subject is touched upon."

On the basis of all these, the examiner rated this particular job applicant a bad risk, and used this reasoning:

"In the opinion of the examiner this applicant is a 90-percent general desirability risk. (Note spotty occupation history, address misrepresentation, the permanency risk factor, present marital status, drinking on job, past terminations, difficulties in military service, arrests, and his honesty risk factor.)

"In my opinion he is an 80-percent honesty risk. (Note marital pressure, financial pressure, termination involving dishonesty, arrests involving dishonesty, electronic evaluator reaction to arrests, dishonesty on the job, and evaluator reactions to dishonesty.)

"He is a 90-percent permanency risk. (Note 'short term' occupation history, other job application, marital pressure, financial pressure, and past job terminations.)

"I consider him a 40-percent accident probability risk. (Note marital pressure, financial pressure, evaluator reactions to indebtedness, degree of drinking, and reactions to arrest.)"

As we mentioned before, this man was not hired, and small wonder. But the important fact is that he would have been if only an ordinary check had been run off on him.

As a matter of fact, much of the derogatory information against him was not even on the record—he himself, under the skillful questioning of the examiner, revealed derogatory information which nobody but he knew about.

This naturally poses the question as to whether or not it's unfair to make an applicant submit to such a test.

Backster and the companies which use his system feel that an employer whose money and property is to be handled by a prospective applicant has every right to find out everything which can be found out about the man.

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And even further, they point out, it can be helpful to the applicant himself, for at least he gets a chance to explain any previous mistakes—a chance which he would not get if an ordinary impersonal check on his record revealed them.

Perhaps most surprising of all is that applicants themselves enjoy the experience of being tested, even when they find themselves revealing information which will certainly cost them the job they are seeking. Almost invariably they go out shaking the examiner's hand, and often promising to take his advice and look for a job where they won't have to be bonded and where they won't handle money or other valuable property.

Since the service is relatively new, its uses are not even as yet fully perfected, and Backster himself is constantly working toward improvement of the evaluator and of the techniques in using it.

But in spite of its newness, the system already has a group of enthusiastic followers, who, once they start using it, are willing to go on record stating that it's well worth every dollar they pay for it.

In fact, they say, it saves them money by cutting down on wasted dollars spent in training men who don't stay, and by greatly reducing costly personnel turnover.

And, according to Charles Langner, vice president of Quaker City Bus Co., the service has produced one other good effect for Quaker City.

"It has given us a substantially better type of employee," Langner says, "and, after all, when you have service to sell that's important."

And John P. Carey, Jr., of Carey Transportation, Inc., in New York City, has this to say:

"We made a survey of the 30 men who have taken the (Backster) test in the past 6 months, and the results have been most satisfactory as compared with employees hired under the investigation system. By the application of this machine we feel we have reduced some of the major problems of a company when it puts new men into service * * * and reduced the danger to the point where it becomes a calculated risk."

EXHIBIT 2D—FORT GORDON CONFERENCE ON STANDARDIZATION

(Reprinted from the Academy for Scientific Interrogation Newsletter)

Your editor was invited to attend a conference at Fort Gordon Lie Detector School the 15th, 16th and 17th of April which proved to be most interesting. The host for the occasion was Thomas R. Beck, ASI member and Director of the Army School of Lie Detection at Fort Gordon. Guests were ASI President J. Frank Faulk, ASI Members Cleve Backster and Les Thompson and a distinguished guest, Mathew J. Wargovich, of the Biological Research Branch of the U.S. Army, Aberdeen Proving Grounds, Aberdeen, Md.

From your editor's viewpoint, the conference was most interesting and educational. I believe it was a "first" in the history of lie detection. One of the main pieces of business was the standardization of a lie-detection technique. Others in attendance at the conference were school staff instructors and ASI members—Mark Briehl, Bob Berry, Tom Puckett, and ASI Applicant Ben Malinowski. All other staff members of the school attended the conference.

It was one of the most interesting technical conferences that your editor has had the privilege of attending as there were many technical questions and problems discussed regarding the standardization of a lie-detection technique. Cleve Backster's finally completed "Standardized Polygraph Notepack and Technique Guide" and the "Backster Zone Comparison Technique" were adopted by the Army school. This is going to be used exclusively by the school and they hope to have all examiners of the Army return to Fort Gordon Lie Detection School for the work conferences and instruction on Cleve's "Standardized Polygraph Notepack and Technique Guide" so that it will be used throughout the Army.

The general atmosphere of wholehearted enthusiasm and genuine acceptance of something in lie detection by all those concerned at this conference was really something to behold. It was a conference of open-minded individuals attempting to seek a solution to something that has been a problem for years. It was most gratifying to observe and to participate in this conference where each and every one of the individuals in attendance have undoubtedly reached a degree of immeasurable success from their own efforts in the lie detection field. Here a group

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of lie detector examiners were able to sit down, with open minds, and resolve their own problems regarding lie detection and arrive at a solution which has far-reaching effects. It was not an atmosphere of any individual reaching or aspiring for any personal recognition, but it was impressive to see a group of intelligent lie detector examiners able to sit, think, talk, challenge, and accept theories and ideas that have been controversial to some extent in the past, now proven and worthy of acceptance for a school for instruction and indoctrination. It was inspiring to see what can be done and what must be done in the field of lie detection today.

On behalf of President J. Frank Faulk, I would like to express our appreciation for the efforts and warm hospitality extended to us by Tom Beck, his staff, and other members of the Fort Gordon Provost Marshal General School's staff in making our visit most productive and interesting.

EXHIBIT 2E—DON'T TRUST THE LIE DETECTOR

(By Richard A. Sternbach, Lawrence A. Gustafson, and Ronald L. Colier)

The use of the polygraph or "lie detector" in industry is increasing. Companies have used it in questioning employees about theft, union activities, and many other topics. "Lie detector" firms are claiming great accuracy for the method.

Is it possible that the value of the polygraph is greatly overrated? Can it do more harm than good when used in the ways mentioned? Yes, argue the authors of this article—two of them professional psychologists who have been doing extensive research with polygraph techniques, the third a graduate student at Massachusetts Institute of Technology who has studied commercial practice. These men contend that—

1. Polygraphic measurements are not valid.
2. The results obtained are not reliable.
3. Serious moral questions surround "trial by polygraph."

Psychologists have for years attempted to understand and predict human behavior, and have devised many ingenious instruments to assess and categorize various character traits. One well-known personality test, for example, not only rates persons on such factors as neurotic tendencies but includes a "lie" scale, which estimates how truthfully the test was answered. Industrial psychologists have used personality, aptitude, performance, and preference tests for hiring and job classification programs. In addition, they have sought, through motivational studies and studies of group processes, to increase job efficiency and employee satisfaction.

But what about employees' morality? Thefts and embezzlements reached $400,000 a day last year.[1] And no one knows how many research and development secrets were given competing companies by disloyal employees, beyond the fact that this kind of betrayal hurts many organizations badly. To make the problem more important still, no company contemplating classified work for the Federal Government can expect to receive contracts if its employees cannot obtain security clearance because there are unresolved suspicions about their loyalty, or because their behavior on or off the job is susceptible to blackmail.

Traditional screening procedures seem not to be effective enough to detect dishonesty- or disloyalty-prone employees. What can be done? One response to the need has been a great increase in the number of polygraph (lie detector) operators in business. From a handful of persons who specialized in lie detection before World War II, there are now over 500 companies in major cities throughout the country offering their services to interested clients. The income of such organizations has been increasing sharply. John E. Reid & Associates, one of the largest security companies, reported an increase of 26 percent in 1960 over 1959.[2] While continuing to engage in lie detection for police departments

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[1] "Business Thefts Add 5 Percent to Cost of Goods," New York Times, business and financial section, June 17, 1962, p. 14.
[2] "To Tell the Truth," Wall Street Journal, Oct. 17, 1961, p. 1.

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and courts in areas where this is legally permissible, security firms now receive 80 percent of their income, according to Business Week, from "manufacturers, merchandisers, and service organizations that want to know whether their workers are, ever have been, or might become dishonest." [3]

With so much reliance being placed on this technique of lie detection, it seems timely to examine it in some detail. How does the polygraph work? What claims do the operators make for it? How accurate is the method?

HOW IT WORKS

The polygraph method is based on the common observation that one or more physiological changes frequently accompany changes in our feelings. For example, many of us have sweaty palms when excited or anxious (remember how damp those test papers got when you took examinations in school). And when a person blushes, we are usually convinced he or she is embarrassed, no matter how vehement the protests to the contrary.

Attempts to use physiological changes as an index to lying are not new. Several hundred years ago, a woman accused of witchery had to chew and try to swallow dry crackers in public "trial." If the task proved difficult because she had a dry mouth, it was assumed she was afraid of detection and therefore guilty of being a witch.

What modern polygraph operators assume, as did the medieval witchfinders, is that attempts at deception or lying will produce a unique pattern of physiological changes which can be differentiated from other states. But while this may sometimes appear to be the case, other factors often produce physiological changes which are very similar. For example, there is the real danger that the changes which occur are not the result of a "feeling of guilt" itself, but rather of recalling some information, or of a shift in attention, or perhaps of some sudden fear of the consequences of being pronounced guilty. It has been noted elsewhere that "there is no way of identifying the emotion by study of the accompanying physiological changes." [4] We can be sure that those hapless women of earlier times, whose mouths were so dry, were experiencing sufficient legitimate fear to give every appearance of guilt—a complication which, unfortunately, still exists today.

INSTRUMENTS USED

In the first quarter of this century several polygraphs were built for lie detection. These consisted of somewhat crude, completely mechanical devices for measuring respiration, heart rate, and an index of blood pressure. Sometimes electrical devices were included for measuring skin resistance (which changes with changes in sweating). The activity of each of the variables was recorded simultaneously on a sheet of moving graph paper, which gave rise to the name "polygraph."

In 1962, the instruments marketed by Associated Research Inc., and C. H. Stoelting Co., the two largest manufacturers of polygraphs for lie detection, offer only slight modifications from the models used more than 25 years ago. Although a very knowledgeable area of medical electronics has appeared in the last several decades, the manufacturers and commercial operators have been content to use the older kind of equipment and the same physiological systems. Apparently, they have made no attempts to determine whether other physiological responses might offer better results.

The National Board of Polygraph Examiners, an organization of polygraphers which recently disbanded, approved certain instruments as being adequate and set forth minimum standards for polygraphs. These standards were so simple that virtually any instrument that recorded breathing and a crude index of blood pressure could qualify.[5]

Meanwhile, back at the laboratory great advances have been taking place in other areas of polygraph work. Making use of more refined electronic circuitry and the increased variety of sensing (pickup) devices available, psyhologists and physiologists have been doing extensive research on some of the applications and limitations of the polygraph. They have devised polygraphs consisting of a

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[3] "Business Uses of the Lie Detector," June 18, 1960, p. 98.
[4] Benjamin Burack, "A Critical Analysis of the Theory, Method, and Limitations of the 'Lie Detector'," Journal of Criminal Law, Criminology and Police Science, vol. 46, 1955, pp. 414–426.
[5] Norman Ansley and Raymond J. Weir, "Selected Papers on the Polygraph," Washington, National Board of Polygraph Examiners, 1956, app. II, p. 21.

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number of sensing devices which are attached to the subject. Amplifiers receive the output of these pickup units and the amplied signal is finally displayed on a moving paper chart. The basic principle is exactly that of your record player except that amplied signals go to oscillographic pens instead of a speaker. A still more advanced form of this sort of recording is used with our astronauts. Physiological changes are telemetered to ground stations via radio frequencies requiring complex little packages which sense, sort, convert and amplify the signals being monitored.)

Changes measured

The most commonly recorded physiological systems in lie detection are pulse rate, breathing, relative blood pressure (not absolute pressure as in a physician's examination), and sometimes sweating of the palms. These have been chosen for two major reasons—their accessibility, and their susceptibility to change. Other, possibly more valid systems, such as changes in the amount of adrenalin circulating in the blood, or constriction and dilation of the pupil of the eye, are more difficult to measure with portable equipment, and so are ignored.

The relatively primitive devices used by commercial operators, as compared with those in use in laboratory and aerospace applications, are only part of the limitations on the polygraph technique. Even with better instruments, the real problem is not acquiring the data but interpreting the data. (We will discuss this difficulty more fully in another section.) It is no exaggeration to say that commercial operators are using the equivalent of biplanes in a rocket age.

OPERATORS' CLAIMS

Vendors of polygraphic services can point to a variety of industrial uses of their product:

Some employers have used polygraph information in the effort to detect specific losses.

Some companies have used the polygraph in attempts to determine loyalty and honesty prior to promotion.

Banks, large department and chain stores, and other institutions where a number of persons handle money are especially confirmed clients.

Some businesses have attempted to keep employees on their toes by having periodic checks of conduct made by commercial operators.

Some corporations give routine preemployment interviews for the stated purpose of screening out criminals, sex perverts, and those who "don't intend to stay long." (Note that rejection here is not on the basis of acts committed, but for "tendencies" or "inclinations.")

We should also mention that another use businesses have found for the commercial polygraph operator, that of questioning employees about their union activities, has recently been ruled unlawful by the National Labor Relations Board.

Judging from all the indications, the commercial operators have not been doing badly. What claims do they make for their lie detection method?

Accuracy and Error

Some commercial operators, in approaching prospective buyers of their services, claim up to 95 percent accuracy and less than 1 percent error, with remaining cases being called "inconclusive." In their book, "Lie Detection and Criminal Interrogation," Fred E. Inbau and John E. Reid offer some figures purporting to justify such claims, but the figures are extremely misleading.[6] For example, they state that out of 4,280 cases run over a 5-year period, 64.5 percent were reported innocent of the crime, 31.1 percent were reported guilty, and 4.4 percent were indefinite (p. 129). The reports were based solely on the polygraph records. Of the group of persons reported guilty, only 791 (59.3 percent) were "interrogated with the aim of obtaining a confession," and of these only 61.4 percent did confess. In other words, only 36 percent of the individuals who were reported as guilty on the basis of their polygraph records were actually verified as such. And only 11.7 percent of the cases reported as innocent were later verified as such. Together there were 18.9 percent of total cases verified as correct. The percentage of verified errors was 0.07 percent (the figure of 0.0007 percent cited in the book is incorrect).

These figures leave us with no information at all as to the correctness of "reported guilty" in about 40 percent of the cases, and with no such information

[6] Baltimore, Williams & Wilkins, 1953.

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at all in almost 90 percent of the "reported innocent" cases. This is a far cry from the claim of "95 percent accuracy."

Most of the claims by others for the effectiveness of this method are not even documented with a number of cases. What it all adds up to is that, aside from the misleading figures of Inbau and Reid and a few others, there exists no public body of knowledge to support the enthusiastic claims of operators. There are no publications in reputable journals, no facts, no figures, tables, or graphs. In short, there is nothing to document the claims to accuracy or effectiveness except bald assertions.

The curious fact about this polygraph business of lie detection is that very few adequately controlled studies of its effectiveness have ever been made. And the useful studies have been done not by the people in the business itself, but by "academic workers," mainly physiological psychologists. The results of their studies indicate that the degree of success is close to 70 percent, much lower than the figure reported by the commercial operators.[7] The controlled laboratory studies are criticized vehemently by the commercial operators as being contrived and artificial, not "real life" situations. This is true. But until figures from less artificial yet controlled studies are presented, these figures must be accepted.

Role of dramatics

Much of the apparent success of the commercial operators is due to the dramatics they use in interrogating their suspects, rather than to the method itself. An aura of infallibility is created, so that subjects really believe "the machine can tell if you're lying." The operators create this aura as an aid in securing confessions from the guilty.

Similar dramatics are used in selling the method to employers. The hiring officer will be told to choose a card, or pick a number, from one of a series, and then to submit to examination by the operator, who has his portable polygraph with him. Because he is often successful in telling which card is held, the operator is frequently hired. This example points up a confusion that often exists over the difference between "guilty knowledge" and "guilty person." The operator is safe in conducting his test because the hiring officer is the "guilty person" who also has the "guilty knowledge" of the card or number. When, however, a difference exists, as in the problem of distinguishing an accessory from a thief, the operator's successes may decrease markedly because he must rely even more than usual on hunches or tricks.

We have heard of an operator who, after screening all workers in a large supermarket as a precautionary measure, was retained by the company simply to walk around the store every 6 months, saying "hello" to all the employees. Such dramatics may be very effective in reducing thefts, but the effectiveness is not in the polygraphic technique. One could do as well, we suspect, with sugar pills described as "truth serum."

"Moral vaccination"

Clarence D. Lee, in his book, "The Instrumental Detection of Deception"[8] continually emphasizes that the role the polygraph plays is that of keeping individuals from committing thefts. "The only real deterrent * * * is fear of the possibility of discovery and punishment, and when possibility is turned into certainty, the effect is increased manifold." Lee sees the threat of possible detection by the polygraph as a tremendous moral force. Later he continues, "Getting caught on the lie detector is a sort of moral vaccination, a shot of integrity in the arm."

The unfortunate consequence of this kind of weapon is that once the hoax is discovered there is very little left of the polygraph's role in detection. In this respect a short tale is often quoted in the lie-detection literature:

"Whenever a crime was committed within his jurisdiction, the prince had all the suspects rounded up and brought into his court in the palace, where they were instructed to stand against the wall with their hands behind them. He then informed them that in an adjoining darkened chamber was a sacred ass which would bray when his tail was pulled by a guilty person, and that they were to go into the room, one at a time, pull the ass' tail, and then return to

[7] See, for instance, Douglas G. Ellson, Roland C. Davis, Irving J. Saltzman, and Cletus J. Burke, "A Report of Research and Detection of Deception," 1952; distributed by the Department of Psychology, Indiana University.

[8] Springfield, Ill., Charles C. Thomas, 1953.

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their original positions against the wall. When this had been done and the ass had not brayed, all suspects were ordered to extend their hands in front of them for examination, whereupon it was found that only one of the group had come out with clean hands—the guilty one. The prince had dusted the ass' tail with black powder, and those with clear conscience had pulled the tail and soiled their hands." [9]

One can imagine that once this story got around the trick would not work again. Similarly, the value of the lie detector as a deterrent would surely collapse quickly in an organization once its weaknesses became known.

Quality of training

The training of professional operators is often less than adequate. There is no governing body which stipulates requirements to be met and passes on candidates, as in the case of doctors, lawyers, accountants, clinical psychologists, and many other groups. The operator may simply have read a book on the subject, or taken a course lasting from a day or two to 6 months.

There are at least three "national" associations of commercial operators. Unfortunately, they seem to have been formed for promotional purposes. The associations sometimes "recommend" that an operator be a college graduate of "high moral character" (presumably one who has passed a lie-detector test). Needless to say, the qualifications of many operators must be suspect.

There are marked divisions and even distrust among various groups of commercial operators. The Reporter, in a two-part series on the use of the polygraph in Government, referred to the fact that various operators judge the number of qualified operators as between 10 and 40.[10] Probably the latter are fellow members of the same national group.

In any event, it seems clear that there are not nearly enough topnotch operators to serve many companies.

TECHNICAL DEFECTS

Although thoughtful businessmen may find much to quarrel with in the way industry uses the polygraph and in operator training, these still are not the only limitations. Far from it. There are far more serious defects in the lie-detection process itself. These defects are inherent and render the polygraph virtually useless. Any measurement procedure of this kind is of value only to the extent that it satisfies certain basic principles:

1. *Validity.*—This refers to the extent to which an instrument measures what it is supposed to measure, as defined by some independent criterion.
2. *Reliability.*—This refers to the extent to which an instrument can produce the same results on subsequent tests, despite the factors tending to cause variability.

We will now discuss these principles briefly as they affect present-day lie detection.

Question of validity

The validity of a measuring instrument is basically a statistical concept, referring to an estimate of the extent to which it correlates with some independent, arbitrary criterion. For example, IQ tests are frequently validated against scholastic achievements, which serve as the index of intellectual capability.

Some measuring instruments have a high degree of validity for certain purposes but not others. For instance, a yardstick is fine for measuring the length of a table, but it is no good for measuring the length of a virus or the distance to the moon. Similarly, the commercial polygraph is good for some things, such as recording the fact of a physiological change, but it cannot record lies, thoughts, feelings, or anything but physiological activity. Furthermore, the extent to which changes in physiological activity may be related to lying or feelings of guilt is not known, and can only be determined in individual cases by confessions. There are no standards of normal "truthfulness" on the polygraph comparable to, say, 98.6° body temperature for fever or 20/20 vision for eyesight.

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[9] Ibid., p. 4.
[10] See Dwight MacDonald, "The Lie Detector Era," the Reporter, June 8, 1954, pp. 10–18; June 22, 1954, pp. 22–29.

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Any test may contain questions which only appear to be related to what the test giver is trying to measure. For example:

Asking a person "yes" and "no" type questions about his childhood might seem to be a valid way of measuring how much of this or that he experienced when young. However, we have no guarantee that his answers reflect what actually happened in his childhood. Such a procedure is said to have only "face validity." Most forms of lie detection seem to be of this sort; they have merely a superficial appearance of validity.

It is much more important that a test have what is called empirical validity; that is, a high correlation between the test score and some independent criterion. This is where lie-detection tests frequently are given credit where it is not due. The physiological changes which accompany lying may also accompany many other things. Consequently, only a low correlation will exist between the polygraph test and the confession criterion.

To be sure, there are many cases in the records, both in field and in laboratory situations, where the physiological response to a given question is markedly different from the responses to other questions, and where it has been found that a lie was told at the time. Despite our critical attitude toward commercial lie detection, we have encountered this case many times in our laboratories, and do not overlook its occurrence. But this fact does not justify what is done in commercial practice. Here, when markedly different responses occur to several questions, the tendency of the less rigorous investigator is to call all such responses "lies" without ever knowing if they really are.

Due to the nature of the field situation and also to the inadequate instrumentation in commercial lie detection, more often than not one is left in a position of never knowing how often some sort of unique physiological response occurs, when lying does not occur, and how often lying occurs without any unusual response. While there is some equivocal evidence on these questions from experimental studies where the lies are always known, there is no really sound information about them from actual field situations. Consequently, the only validating criteria available at present are confession of guilt and absolute proof of innocence. Without these, the operator's judgment or report is useless.

Earlier we mentioned a study by Inbau and Reid. It is a good example of what we have been discussing. We have no idea of how many of the responses on the polygraph records reportedly indicating guilt were responses actually caused by something else; nor do we know how many of the records which were judged as indicating the person was innocent simply failed to show physiological responses when lying actually occurred.

Until such information is produced, businessmen should not endorse the use of polygraphic lie detection in industry. A lie detector simply records certain physiological changes. Sometimes these may be related to lying or guilt, but the burden of proof in such an important matter should be up to the commercial operators who give the tests, not those exploited or possibly harmed.

Question of reliability

The reliability of an instrument is the statistical estimate of the correlation between repeated measures obtained. We would expect repeated measures of a table's length obtained by a yardstick to yield high reliability scores. If this did not occur, and we had reason to believe that the table was not growing or shrinking, we would rightly suspect that something was wrong with our yardstick.

What about reliability in lie detection? Commercial polygraph operators hardly even repeat their tests, and consequently cannot stipulate the likelihood of an individual's pattern of responses being repeated. It is significant that when the National Board of Polygraph Examiners set up some minimum standards for polygraph instruments there was no mention of reliability.

Much of the work done in the laboratories of psychophysiologists and others who are investigating the relationships between psychological and physiological events has been concerned lately with this problem of reliability. Unfortunately, polygraph measures appear to have a high degree of unreliability unless a number of factors, such as room temperature and humidity, time of day, concentration of various constituents in the air, the subject's previous activities, and so forth, are rigidly controlled (which would be very difficult or impossible in industrial practice.) Such factors are not taken into account by the commercial operators.

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Another question concerns the relationship between the level of physiological activity prior to stimulation and the kind of response produced by the stimulus. If a person's blood pressure is at a very high level prior to a leading question, there is little chance that it will increase much more in response to that question. The response may even be in the opposite direction. Furthermore, the amount of change will often depend on the preceding level of activity even when this is not extreme. This phenomenon is known as the law of initial values. For example, an increase in heart rate from 75 to 85 beats per minute is not at all the same thing as an increase from 85 to 95; the percentage increase is quite different.

In order to evaluate a physiological response properly, the preceding level must be taken into account. Commercial operators do not consider this problem. In fact, their equipment typically has no quantitative measure of blood pressure at all, just a line which fluctuates up and down with relative changes in pressure. And many of the newer polygraphs now include circuits which automatically recenter all pens after a given time, making it impossible even to get an idea of their baselines. Consequently, such factors as the subject's anxiety about the test procedure and its effect on his career, his feelings about the electrodes, his reaction to the operator, and other concerns, all of which alter his physiological levels of functioning and therefore his responses cannot be taken into account.

Cutoff levels

Even with the best of tests, errors of classification are made. These can be of two kinds: (1) "false positives," those erroneously judged guilty; and (2) "false negatives," or undetected guilty persons.

The proportion of false positives to false negatives will depend on the criterion established by the operator as to the level of response he will consider guilty. If he sets this level too low, so that the slightest variations are considered significant, then the operator will incorrectly judge too many persons to be guilty; he will have too many false positives. If he sets his cutoff level too high, so that only extreme deviations are considered significant, then the operator will miss too many guilty suspects; he will have too many false negatives.

Ideally, a compromise should be possible, and it is in most psychological testing. But in commercial lie detection, operators simply cannot discover their false negatives, and so cannot make such a compromise. Therefore, claims of 90- to 100-percent accuracy are meaningless.

Of course, most of the false negatives are quite happy to remain in this category, as they would hardly want to refute the stamp of innocence. On the other hand, especially in preemployment exams, the false positives are given little chance to prove their innocence. Aside from the great inconvenience caused the individual by misclassification, problems are also created for business. For instance, if there are only a few persons available for a given position, the price of rejecting an applicant because of misclassification may be very high. This is especially true in highly skilled areas and at executive levels.

Level of costs

The costs of polygraphic lie detection are quite prohibitive, considering what the employer is getting. The average cost for screening charged by the commercial operators is $20 to $30 per person. Add to this the number of guilty persons who go undetected (false negatives), the costs to the reputations of those persons unjustly accused (false positives), and the possible loss of valuable manpower through unjust accusations—and the expense, in a larger sense, becomes considerable.

MORAL QUESTIONS

For policymaking executives in particular, the lie detector raises more than technical issues of validity and reliability.

The use of polygraphic techniques either to detect or to avoid hiring certain persons constitutes a subversion of judicial processes to "trial by polygraph." An individual is persuaded by social pressures to testify against himself through a distorted, error-ridden medium; he may be denied the right to work without ever knowing the reason why; he may be "convicted" of certain "tendencies" without having committed an illegal act; and he has no defense against the operator's report, since it is unknown to him and he has no rights in the process by which it is drawn up and used.

If management permits the polygraph to be used in corporate work, surely it cannot expect employees to be oblivious to matters like these. Indeed, most

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Americans are highly sensitive about their rights as employees. Surely, too, the polygraph will be viewed as a symbol of management suspicion and distrust. The atmosphere for work will inevitably be affected. One can easily imagine resentful employees making increasing use of words like "sneaky," "underhanded," and "Gestapo" in their characterizations of the company.

CONCLUSION

What is the answer, then, to the problems of screening employees for security, detecting crimes, determining loyalty, and learning other types of information that workers may not want to divulge?

The answer, simply, is that there is no really effective mechanical technique yet available. The problems still exist, and there are no pat answers. The polygraphic method will be effective only as long as people believe it is a real "lie detector," and confess their guilt when confronted with fancy-looking squiggles on chart paper. But it is going to be increasingly difficult to delude them in this respect. While those who "beat" the machine naturally are not going to brag about it, the inherent weaknesses of the polygraph cannot be concealed for long from discerning employees. And there will always be the cries of the innocently accused.

Management has other ways of gaining information about employees—tests, questionnaires, interviews, and probably best of all, firsthand observation of performance. These ways may be slower and more time consuming, but in the long run they are still the best a company can use.

EXHIBIT 2F—DON'T TRUST THE LIE DETECTOR VERSUS DO TRUST THE LIE DETECTOR

(By Cleve Backster)

[Reprinted from Law and Order magazine, February 1963 issue, Academy for Scientific Interrogation Section]

The first of the above titles "Don't Trust the Lie Detector" is actually that of a feature article which appeared in the November-December issue of the Harvard Business Review. This shocking injustice to the truly scientific brand of lie detection was authored by Richard A. Sternbach, Lawrence A. Gustafson, and Ronald L. Colier. An insert paragraph states that two of the authors are "professional psychologists who have been doing extensive research with polygraph techniques, the third is a graduate student at Massachusetts Institute of Technology who has studied commercial practice."

One thing you can be certain of is that none of them are authorities, or even well-known practitioners in the field of scientific lie detection. For these individuals to take it upon themselves to be so critical of a field they know so little about is like this author writing a critical article on the Rorschach Inkblot Test or the Bernreuter Personality Inventory, both of these being important tests in the field of psychology. Despite our justification to challenge these individuals' right to present such a totally destructive criticism of a specialty they mistakenly may feel within their realm—the sad part of it is that we, within the polygraph field, have provided them with the ammunition to fire at us.

STATISTICS

The area of polygraph statistics is one where we have left ourselves wide open to any statistician who cared to attack us. We must presume one or more of the authors, Sternbach, Gustafson, or Colier, to be well grounded in statistics, or certainly to have obtained sound information from a properly informed source. We must acknowledge the fact that research statistics are well within the scope of recognized capabilities of numerous psychologists. One lesson we certainly should learn from this article is to seek proper advice before presenting statistics on polygraph accuracy or effectiveness.

Chic Hanscom, of the University of Minnesota, emphasized this during a presentation "Statistical Evaluation of Examiner Success," before a group of nearly 100 polygraph examiners attending the polygraph examiners clinic conducted by Los Angeles State College, September 4 through 7, 1962. The lie detection

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field is one that embraces an extremely difficult set of conditions which prevent an adequate "verification" followup as to the ultimate answer regarding a polygraph subject's guilt or innocence. In the past it has also been virtually impossible to identify that portion of succes which was due to the psychological impact of the procedure, as compared to that portion of success based on determinations initially arived at exclusively through evaluation of the polygraph charts.

In their subsection entitled "Accuracy and Error" in the Harvard Business Review article the authors severely criticize the vague, incomplete, and erroneous published polygraph statistics as well as the methods by which they were calculated. We have now been called to task for inadequate statistics released during past years—and what defense do we have? I know of none, and furthermore if we attempt to defend such statistics of the past we are playing the psychologist's game with his rules and on his home grounds. In my opinion our efforts should be directed toward the accuracy and soundness of future statistics rather than toward attempts to justify those of the past.

ROLE OF DRAMATICS

In this section of their article authors Sternbach, Gustafson, and Colier state that much of our apparent success is due to dramatics we use while interrogating our polygraph subjects rather than to the polygraph method itself. They further state we create an aura of infallibility so that polygraph subjects really believe "the machine can tell if you are lying," and that this aura of infallibility is used as an aid in securing confessions from the guilty. Later in their article they state that "once the hoax is discovered there is very little left of the polygraph's role in detection."

During nearly 5 years as chairman of the Research and Instrument Committee of the Academy for Scientific Interrogation, I have continually voiced criticism in my talks and published papers of the large number of polygraph examiners in the field today who are using obsolete techniques and are relying far too heavily upon interrogation and the psychological impact created by the very presence of the polygraph equipment. Further I have loudly voiced the need of greater uniformity in polygraph examination technique.

Fortunately the accuracy of the claims of the authors of the article "Don't Trust the Lie Detector" centers around outdated techniques and those examiners who still use such obsolete methods.

The allegedly thorough research efforts of the authors of this article apparently missed completely the existence of updated polygraph techniques, and the very existence of the work being conducted by our research and instrument committee. I do not know of a single visit or contact by any of the authors with our committee.

NOW OR NEVER

Although directed primarily toward the private or commercial examiner the widespread circulation of such a journal as the Harvard Business Review can render a near fatal blow to the use of the polygraph—not only the commercial use, but its use in law enforcement also. The stigma of such an article can surely create an atmosphere in which antipolygraph legislation can more easily be accomplished. With the passage of such legislation how can the law enforcement examiner request a citizen to take a polygraph examination where, should a business executive make the same request, he would be subject to a heavy fine or a jail sentence, or both.

A sound polygraph technique does exist and does not fall within the areas of weakness criticized by the article under discusion. There are many examiners who do not use this, or a similarly sound technique. It is vitally important that this group of examiners alter their approach if lie detection is to perpetuate itself as a useful law enforcement technique. It is also extremely important that law enforcement leaders monitor the efforts and methods of commercial examiners, practicing within their jurisdiction.

Fill out the below checklist and see if you, or the polygraph examiner within your department, are following sound and modern polygraph techniques and procedures. If the score is low, we urge you to act now to seek information or retraining for those responsible for operation of your polygraph. The very existence of the polygraph profession is at stake. The next move is up to you.

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(Checklist follows:)

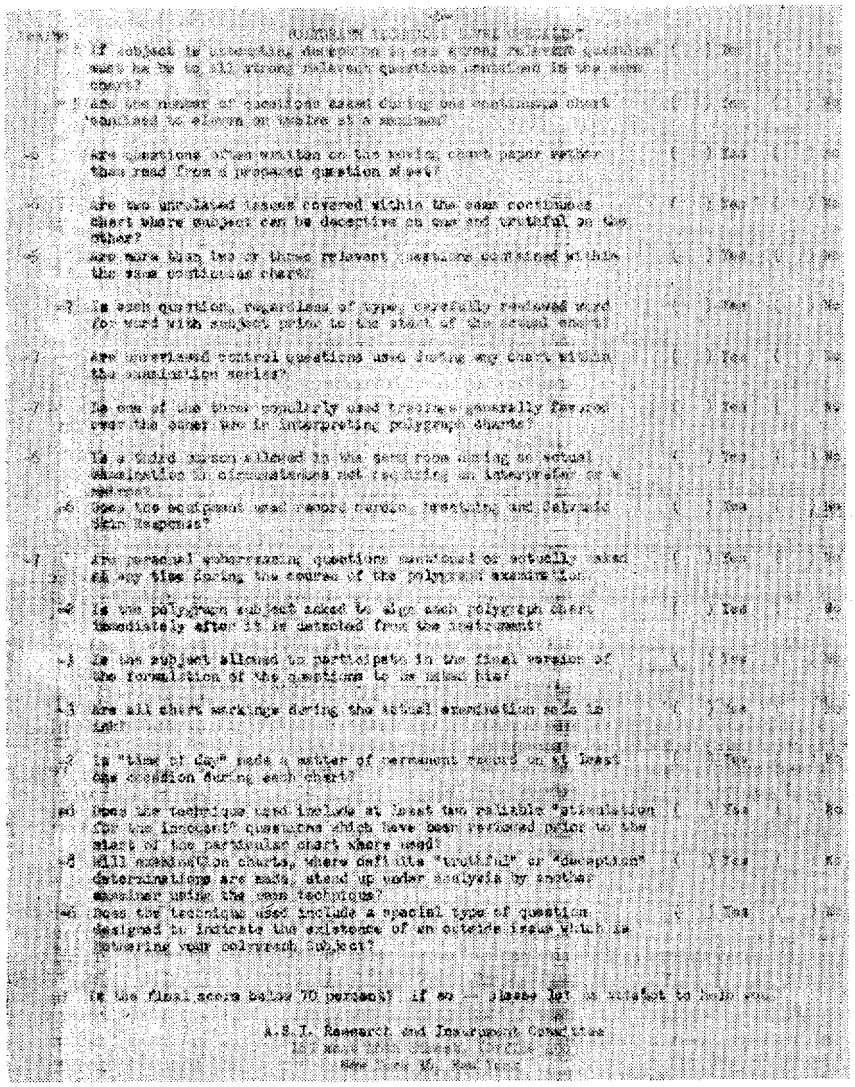

EXHIBIT 3—SUMMARY OF FEDERAL POLYGRAPH USE

In response to a subcommittee questionnaire, 19 Federal agencies reported that their policies permitted the use of polygraphs in carrying out Government business. The replies of these 19 agencies, broken down by their constituent units which use the device, are shown in tabular form at the end of this exhibit. The following narrative explains the terms used in the table and provides a general analysis of the data.

A. PURPOSES FOR USING POLYGRAPHS

1. *Security.*—Cited by 14 of the 19 agencies, the most frequently reported purpose for the Government's use of polygraphs involves security matters. In this context security ranged from investigation of security leaks to operational uses in intelligence and counterintelligence activities.

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The number of defense organizations included among the 19 users underlines the importat role the instrument plays in the many-sided efforts to safeguard the Nation's security. Each of the military services was accounted for, with the Intelligence Corps and the military police both reporting polygraph use within the Army, and the Marine Corps and naval intelligence answering the roll within the Navy Department. The Office of Special Investigations was the sole reported Air Force user. Civilian components of the Defense Establishment also were well represented. The Central Intelligence Agency reported extensive polygraph use, as did the National Security Agency. Also within the Defense Department, the Defense Atomic Support Agency and the Defense Supply Agency acknowledged use of the instrument. Several nondefense agencies also indicated that their activities in the security field involved use of polygraphs.

2. *Criminal.*—Investigation of criminal law infractions was listed by 10 agencies as an area in which polygraphs are employed. Private citizens as well as Federal employees came within the scope of such investigations. The Agriculture Department, for instance, has considered the results of polygraph tests conducted outside the Government in investigating cases of alleged fraudulent transactions with the Agricultural Marketing Service.

3. *Misconduct.*—Investigation of employee misconduct was a reason given by eight agencies for utilizing polygraphs. This category included offenses not considered to be criminal violations.

4. *Personnel screening.*—The Central Intelligence Agency and the National Security Agency indicated that polygraph testing is included as a routine part of preemployment personnel screening. The armed services also reported a similar use during fiscal 1963 in connection with the program of enlisting Cuban refugees. This was a unique situation, however, since the military normally does not employ the device in recruitment or induction processing.

5. *Medical measurements.*—The Health, Education, and Welfare Department reported that three of its bureaus—the National Institutes of Health, the Public Health Service, and St. Elizabeths Hospital in the District of Columbia—used polygraphs for medical purposes. As a device which measures pulse rates, respiration rates, and blood pressure, the polygraph has been used to record the reactions of patients under anesthesia.

The device also has found use in cases involving patients with mental or neurological disorders. More frequently, it has been employed on animals undergoing experiment.

B. Extent of Polygraph Use

Except for the personnel screening category, the user agencies declared that polygraphs were not used in every case. The Atomic Energy Commission, for instance, said that the device was involved in processing only 1 of 29,300 security clearances processed during fiscal 1963. Similarly, the machine was employed in 0.14 percent of the FBI investigative matters handled in fiscal 1962.

The frequency of polygraph use in Air Force investigations varied from once in every 43 cases in 1959 to once every 18 cases in 1962. The Internal Revenue Service, which restricts polygraph tests to employees who request them, reported such tests were used in fewer than 10 cases in the last 10 years.

Other agencies indicated that investigative techniques affected the extent of polygraph use. The Defense Atomic Support Agency said the device is used normally "to gain information not otherwise attainable by other investigative techniques." The Coast Guard replied that polygraph tests are administered when "there is conflicting evidence, [or] the subject requests an examination, or it appears that an examination would materially aid the investigation." The Post Office Department limits the device to "cases of more than average importance where the investigation is at a standstill because the inspector cannot prove a suspect guilty or eliminate him from suspicion even though he has exhausted all normal investigative techniques."

Several agencies referred to the polygraph as an investigative "tool" or "aid" which was used "seldom" or "on rare occasions."

In the area of personnel screening, the two agencies concerned—the CIA and the National Security Agency—were not clear as to the exact extent of polygraph utilization. The CIA flatly answered that "all applicants and employees are afforded polygraph examinations as part of security screening procedures" while also implying a less-than-mandatory practice by saying that a refusal to take a test would be "considered along with other information developed in processing an applicant." The NSA advised that polygraph interviews are a required part

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of preemployment processing for all civilian applicants. After becoming a NSA employee, however, a person is subjected to such a test only in connection with matters "extensively investigated but difficult to resolve." In the past, polygraph examinations have not been required of military personnel before their acceptance for assignment to NSA.

C. Polygraph Tests Conducted During Fiscal 1963

The Federal Government conducted 19,122 polygraph tests during 1963, according to the answers to the subcommittee's questionnaire. And this amount did not include the thousands of tests which the CIA and NSA gave to "all applicants and employees," since the agencies claimed the number of tests must be classified as "security" information.

The information compiled by the subcommittee showed the Army to be the heaviest Government user of polygraphs. During fiscal 1963, the Army conducted roughly 12,500 tests or more than half of all those reported by the Government. Screening of Cuban enlistees, a situation presumably unique to the period reported, accounted for 3,494 Army tests with the polygraph. The Federal Bureau of Investigation reported 2,314 tests.

D. Polygraph Tests Requested During Fiscal 1963

Not all Government units using polygraphs maintain their own specialized staffs and facilities to carry out the tests. On some occasions, agencies do not have their own equipment or operators available at the scene of investigations.

During fiscal 1963, these conditions led to 322 polygraph tests being requested by Federal agencies. The Post Office Department accounted for 134 requests while the Secret Service requested 110 tests.

Although there was uniform reluctance to specify the agencies to which the requests were directed, it was generally implied that such matters remained within the Federal Government. The General Services Administration, however, requested 10 tests during the year and indicated that an unspecified number of these were performed by local law enforcement agencies.

E. Polygraphs Owned by the Federal Government

At total of 512 polygraphs or other so-called lie detection devices were reported as owned by the Federal Government at an estimated acquisition cost of $428,066. This does not include the CIA and NSA which claimed that the number and acquisition value of the polygraphs they possess is classified as security information.

The Army led the statistics in this department, possessing 261 devices which cost an estimated $182,700. The Navy Department was next with 86 machines, including 9 owned by the Marine Corps, followed by the Air Force with 72, and the FBI with 48. The Post Office Department reported they own 17 "lie detection" devices, 13 of which were acquired more than 10 years ago and employ only a one-phase, skin resistance detection procedure. The Post Office Department stated that they intend to dispose of these one-phase instruments in the current fiscal year.

F. Authorized Polygraph Operators Within the Government

Federal agencies reported 639 employees are authorized to conduct polygraph tests. Their salaries during fiscal 1963 amounted to slightly more than $4.3 million. However, administering polygraphs examinations is only one of many assigned duties to the great majority of these Federal workers. For example, the FBI reported that the 46 special agents authorized to perform polygraph tests spend an estimated 6 percent of their time on such activity. Accordingly, the FBI contended that only 6 percent of the agents' $616,667 annual salaries—or $37,000 per year—can be directly attributed to work involving the polygraph. On this same point, authorized Army military policemen devote less than 5 percent of their time to polygraph activities, averaging 1.8 tests per month for each examiner. Post Office Department inspectors reportedly average less than 3 percent of their total effort with the device and the Secret Service attributes less than 1 percent of the total operators' salaries to work involving the machine.

The National Security Agency and the CIA are the only organizations indicating that handling polygraph tests is the primary duty of any employees.

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Numerically, the Army again was highest, reporting 358 polygraph operators on its rolls in fiscal 1963. The Navy Department followed with 106 examiners—86 assigned to naval intelligence and 20 to the Marines. Next on the list was the Air Force with 73 authorized operators.

Once more these figures do not include CIA and NSA which claim they are exempted by statute from disclosing information regarding the number and salaries of their employees. CIA claims as authority 50 U.S.C. 403(g),[1] and NSA claims as authority section 6 of Public Law 86–36 (50 U.S.C. 402 note).[2]

G. Other Annual Costs

More than $56,000 a year in costs related to polygraph use was reported by the 19 agencies. This figure is a bare minimum, as such costs were very sketchily estimated due to widely varying recordkeeping. Intended to be included in this category were training and travel expenses of polygraph operators, maintenance of the polygraph machines, and similar recurring costs. In addition, the Air Force reported an expenditure of $24,953 during fiscal 1961 for a contract with Fordham University (New York) on studies in lie detection.

II. Safeguards for Individuals

Included in the subcommittee questionnaire were several queries designed to reveal the steps taken to safeguard the rights of individuals who undergo polygraph tests. In this regard the agencies were asked what relative weight is accorded polygraph test results or refusals to be so tested, whether the use of polygraphs is subject to review, whether tests results are available to the individual, whether an avenue of appeal exists, and whether an individual's physical and mental condition are considered.

1. *Effects of refusals.*—In response, every agency provided assurances of one form or another that polygraph tests are given only with voluntary consent from the person to be tested. Even in the employment screening programs of the CIA and the NSA, where polygraph tests approach the point of being mandatory, applicants may refuse to submit to polygraph testing. Whether a refusal would dim a job applicant's chances is not clear. The CIA simply said that refusals would be "considered along with other information developed * * *" while the NSA indicated an applicant's refusal would require "more exhaustive investigation."

A number of agencies expressly declared that refusals do not prejudice the outcome of an investigation. The Air Force, for example, stated "no inference is or may be made from * * * refusals" while the Army military police assured that "failure to volunteer for an examination is not construed as a tacit admission of guilt." Similarly, the Defense Atomic Support Agency said that a refusal "cannot be construed as an admission or even a partial admission of guilt" and the Post Office Department asserted the refusals cannot form the "basis for any recommendation."

While the Marine Corps went along with most agencies in saying a refusal "is not considered as proof or evidence of facts sought to be confirmed," the Office of Naval Intelligence thought otherwise. "It is safe to say," stated ONI, "that this Office realize [sic] that some subjects refuse to submit to examinations on the basis of moral scruples which they consider valid, in other cases a refusal may be considered a tacit, admission of guilt."

The Defense Supply Agency also had some doubts about refusals. "While only limited significance is attached to data developed by the polygraph test," DSA said, "in a clear-cut 'did-you-or-didn't-you' situation refusal * * * is considered as an unfavorable reflection on the credibility of the individual's statement."

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[1] 50 U.S.C. 403(g) states: "In the interests of the security of the foreign intelligence activities of the United States and in order further to implement the proviso of section 403(d)(3) of this title that the Director of Central Intelligence shall be responsible for protecting intelligence sources and methods from unauthorized disclosure, the Agency shall be exempted from the provisions of section 654 of title 5, and the provisions of any other law which require the publication or disclosure of the organization, functions, names, official titles, salaries, or numbers of personnel employed by the Agency: *Provided*, That in furtherance of this section, the Director of the Bureau of the Budget shall make no reports to the Congress in connection with the Agency under section 947(b) of title 5."

[2] Sec. 6(a) Except as provided in subsection (b) of this section, nothing in this act or any other law (including, but not limited to, the first section and section 2 of the act of August 28, 1935 (5 U.S.C. 654)), shall be construed to require the disclosure of the organization or any function of the National Security Agency, of any information with respect to the activities thereof, or of the names, titles, salaries, or number of the persons employed by such agency.

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A member of the District of Columbia's Metropolitan Police Department can be ordered to take a polygraph test, and be subject to disciplinary action if the order is disobeyed, but for any other suspect a refusal "can be given no weight as to guilt or innocence."

With the exception of the District of Columbia Police Department, all agencies reported that refusals by employees to take polygraph tests are not noted in their personnel records, although such matters might be mentioned in investigative reports.

2. *Weight accorded polygraph test results.*—No agency admitted attaching great significance to the results of polygraph examinations, but there were indications that such tests influence at least the course of investigations.

The Atomic Energy Commission reported that polygraph test results alone were not conclusive but if they were at variance with the findings of field investigations, additional fieldwork would be carried out to resolve the discrepancies. The Defense Atomic Support Agency and the General Services Administration stressed that they attached no weight to such test results without confirmation by subsequent admissions.

The results are not used by the National Security Agency in "reaching any finding" but only to "identify areas in which the individual should be questioned further." In a similar vein the National Aeronautics and Space Administration said the device is used "for formulating additional investigative coverage."

A balanced statement on this point was issued by the FBI, which said the "polygraph can be helpful to implement an interrogation and provide investigative direction but it must not be relied on solely or used as a substitute for logical investigation."

The Internal Revenue Service seemed inclined to give the individual being tested the benefit of the doubt. "Where such test is favorable to the subject, it might be given considerable weight," IRS said. "When the test is unfavorable, it would simply be considered with all other information * * *."

The polygraph was felt to be an invaluable investigative aid by the Office of Naval Intelligence, which also cautioned that an accuracy rate of 70 percent is considered optimum.

3. *Review of polygraph use.*—Almost all of the 19 agencies indicated that use of polygraphs is subject to review by authorities higher than those persons immediately involved in handling investigations.

One reported exception to this review practice was the CIA. That Agency apparently considers a system of review for each instance of polygraph utilization as unnecessary since the Director of Central Intelligence has established the policy that all applicants and employees will be afforded polygraph examinations as part of security screening procedures.

Likewise, polygraph tests are a required part of the National Security Agency's preemployment processing of civilian applicants, and there is no process to review each applicant's case to determine whether the testing is appropriate. However, there is a system for reviewing the decision to test NSA employees.

While the Defense Supply Agency maintains a review process for all recommended tests in criminal investigations, security operations are handled differently. The use of polygraphs in DSA security matters is decided, without subsequent review, by the intelligence officer in charge at the field activity concerned or at DSA headquarters in Washington.

4. *Availability of results to individuals tested.*—Five agencies—Central Intelligence Agency, Defense Supply Agency, Department of the Air Force, National Security Agency, and the Federal Bureau of Investigation—indicated they do not make known the results to individuals undergoing polygraph examinations. All other agencies using the machine said they either routinely advise the individual tested of the results or provide the information upon request.

5. *Appeals of polygraph test results.*—A number of agencies reported that they have no system permitting the appeal of adverse polygraph test results. Most of these agencies reasoned that an appeal limited to the results of polygraph tests is unnecessary since no action is taken against individuals solely on the basis of such examinations; however, these agencies went on to say that any administrative action resulting from an investigation would be subject to appeal.

The District of Columbia Metropolitan Police Department answered that the right of administrative appeal does not apply in its uses of the machine "since

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all criminal cases must ultimately be presented to a court of law and the results of polygraph examinations are not admissible in these courts."

But a sizable number of agencies and their components said they provide a means of appeal, usually by conducting a new test with a different operator. Agencies allowing an appeal or reexamination of some sort are the Army, the Marine Corps, the Coast Guard, the Internal Revenue Service, the Secret Service, the U.S. Information Agency, and the U.S. Park Police of the Interior Department.

6. *Consideration of physical and mental conditions.*—Each agency reporting the use of polygraphs, and all of their affected units, informed the subcommittee that consideration is given to the physical and mental conditions of individuals to be tested.

A few agencies, including the Air Force, the Commerce Department, the Defense Atomic Support Agency, the National Security Agency, and the State Department, said they obtain professional medical advice when there is a question of physical or mental suitability to undergo polygraph tests.

While most other agencies simply indicated that consideration is accorded, few further details were volunteered. The Post Office Department, for example, noted that "susceptibility tests are given to determine * * * mental suitability." Similarly, Naval Intelligence said: "It is well understood the physical-mental conditions of many subjects will render them unsuitable as testing subjects either on a temporal or permanent basis."

The U.S. Information Agency was slightly more specific, stating that the matter "is left to the professionalization of the [polygraph] operator."

I. Qualifications of Government Polygraph Operators

In order to ascertain the qualification of the polygraph operators within the Federal Government, the subcommittee asked those 11 agencies that employed polygraph operators for a breakdown of the minimum requirements for the operators. Included among the criteria were age, education, grade or rank, years of investigative experience, any character investigation or agency check, and type of special polygraph training.

1. *Minimum age.*—Although most agencies have set 25 years as the minimum age for a polygraph operator, the District of Columbia Metropolitan Police Department allows a policeman aged 21 to conduct the polygraph tests. The Coast Guard minimum age is 22, while CIA "prefers" their operators to be 30 years old. There is no minimum age requirement in the FBI, but all examiners must be special agents and the minimum age for such an agent is 23 years.

2. *Educational requirements.*—The educational requirements for polygraph operators in the Federal Government vary from agency to agency. The minimum requirement is a high school degree, although an Army military policeman must have 2 years of college education before becoming eligible to perform polygraph tests. CIA, NSA, FBI, Office of Naval Intelligence, and the Secret Service all require a college degree.

3. *Grade or rank.*—The minimum grade or rank requirement for polygraph operators varies greatly throughout the Government. The District of Columbia Metropolitan Police Department has no special requirement, while the Central Intelligence Agency requires its polygraph operators to be a GS–11 (with base annual salary of $9,004). The FBI requires its polygraph operators to be a special agent, which has the grade of GS–10 ($8,450). Other grade or rank requirements include: Army Intelligence, E–5 ($4,738); Army Military Police, warrant officer ($6,632), NSA, GS–11 ($9,004); and Post Office Department, PFS–13 ($12,639).[2]

4. *Investigative experience.*—Three agencies—the District of Columbia Metropolitan Police Department, the FBI, and the Marine Corps—have no minimum requirement for years of investigative experience. The remainder of the agencies employing polygraph operators vary in their requirements from 1 year to 5 years.

5. *Agency check or character investigation.*—All prospective polygraph operators within the Federal Government must be given either an agency check or a background investigation prior to approval as an operator. NSA reports that all applicants for polygraph operator must pass a polygraph screening test.

[2] Salaries derived from tables found on p. 13415, Congressional Record, Aug. 6, 1963.

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6. *Training program.*—The majority of agencies that employ polygraph operators train them at the Army Provost Marshal General School, Fort Gordon, Ga. The Coast Guard and the Post Office Department also make use of a private source of instruction—the National Training Center of Lie Detection in New York. CIA requires polygraph trainees to take an internal academic course for 5 weeks plus an additional 4 months on-the-job training. The FBI also conducts an internal training course and advanced training seminars.

7. *Other requirements.*—No one agency can be compared with any other in their "other requirements" for authorizing a polygraph operator. The requirements range from a thorough understanding of communism (NSA), foreign language fluency and physical ability to travel extensively (CIA), to emotional stability and lack of distracting scars or impediments (Air Force).

EXHIBITS 4A-4F—BIOGRAPHICAL SKETCHES SUBMITTED BY POLYGRAPH EXAMINERS APPEARING BEFORE THE SUBCOMMITTEE

EXHIBIT 4A—CLEVE BACKSTER

Mr. Cleve Backster received his initial polygraph training directly from the late Leonarde Keeler. Prior to this specialized training, which was in 1948, he had been serving in the U.S. Army Counterintelligence Corps as an interrogation instructor at their Fort Holabird (Md) headquarters.

From military service, he accepted a position with the Central Intelligence Agency, as an interrogation specialist. In 1949, as part of his duties as the head of a section, he instituted the polygraph examination program, which to date is still active. Mr. Backster left CIA to accept the position of director at the Leonarde Keeler Polygraph Institute in Chicago, Ill., and during 1950 conducted classes heavily attended by military and Government agency personnel, as well as law enforcement personnel.

In 1951, he founded Cleve Backster, Inc., which is the owner and operator of the Backster School of Lie Detection. This school is unique in that it is the only nonmilitary polygraph school conducting advanced courses in polygraph usage. During the period of 1959 through 1962, Mr. Backster was also the director of the National Training Center of Lie Detection. During this 4-year period, this organization handled the polygraph training initially conducted by the Backster School of Lie Detection. In the latter part of 1962, the training function again returned to the Backster School of Lie Detection.

Since 1949, Cleve Backster has at some time served as a polygraph consultant to most every Government agency who has made use of polygraph. He is the current chairman of the Research and Instrument Committee of the Committee of the Academy for Scientific Interrogation, a post to which he has been reappointed to each year since 1958, and is also the cochairman of the Research and Instrument Committee of the International Association of Polygraph Examiners. During his intensified research efforts, which started in 1958, Mr. Backster made compatible, coordinated, and added to various existing polygraph techniques prevalent in the overall polygraph field, and as a result compiled the Standardized Polygraph Examiner Notepack. This notepack has been widely adapted as a standard throughout the polygraph field, and is featured at a number of polygraph examiner training schools, including the Fort Gordon (Ga.) U.S. Army Polygraph School.

Mr. Backster has been a member of the Academy for Scientific Interrogation each year since its start in 1948, and has been on the board of directors during the past 2 years. For the past 3 years, he has served as editor of the polygraph and interrogation section sponsored by the Academy for Scientific Interrogation, which has been published monthly in a widely circulated law enforcement publication. He has also been active in helping design the present day polygraph equipment, has authored numerous articles circulated within the polygraph profession, and has compiled a manual on the "Zone Comparison Technique," this being the consolidated technique widely used in the polygraph profession today.

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TABLE OF AGENCY REPLIES

The Federal Government's use of polygraphs

Agency	Purpose	Tests performed during fiscal 1963	Tests requested during fiscal 1963	Polygraphs owned	Acquisition cost	Authorized polygraph examiners	Salary costs during fiscal 1963	Other annual costs, fiscal 1963	Minimum qualifications for polygraph examiners: Age	Education	Grade or rank	Years of investigative experience	Agency check or character investigation	Training program	Other requirements	Use subject to higher review	Results available to testee	Test results subject to appeal	Formal regulations governing use
Agriculture Department	Criminal	0	0	0		0													No.
Arms Control and Disarmament Agency	Security	0	0	0		0										Yes	Yes	No [1]	No.
Army:																			
1. Intelligence	Security and personnel screening. [2]	[2] 8,094	0	143	$182,700	152	$799,836	$18,270	25	High school	E–5 (staff sergeant).	3	Yes	Army Military Police School, Fort Gordon, Ga. (7-weeks course)	1. 3 years of superior to outstanding ratings. 2. Language proficiency. 3. Be accredited intelligence agent. 4. Passed intelligence course.	Yes	Yes	Yes	Yes.
2. Military police	Criminal	[2] 4,400	0	118		206	988,300		25	2 years, college	Warrant officer.	1	Yes	do	1. U.S. citizen. 2. No court convictions. 3. Be accredited investigator. 4. Passed criminal investigation course	Yes	Yes	Yes	Yes.
Atomic Energy Commission	Security	0	1	0		0										Yes	Yes	No [1]	No.
Air Force	Security and criminal	[4] 1,912	(5)	72	82,186	73	494,766	28,297	25	High school	E–5 (staff sergeant).	5	Yes	Army MP school	1. Demonstrated interrogative proficiency. 2. Understand human nature, sociable. 3. Emotionally stable. 4. Articulate. 5. Free of distracting scars or impediments.	Yes	No	No [1]	Yes.
Central Intelligence Agency	Security and personnel screening.	(*)	0	(*)	(*)	(*)	(*)	(*)	30	College degree	GS–11	1	Yes	Internal, 5 weeks' academic; 4 months' on-the-job training.	1. Foreign language fluency. 2. Physically able for extensive travel.	No	No	No [1]	Yes.
Commerce Department	Security and misconduct	0	2	0		0										Yes	Yes	No [1]	No.
Defense Department:																			
1. Defense Atomic Support Agency	Security, criminal, and misconduct.	140	0	3	3,440	3	19,016	1,984	(6)	(6)	(6)	(6)	(6)	(6)	(6)	Yes	Yes	No [1]	Yes.
2. Defense Supply Agency	Security and criminal	0	7	0		0										Criminal cases only.	No	No [1]	No.
3. National Security Agency	Security and personnel screening.	(†)	(†)	(†)	(†)	(†)	(†)	(†)	25	Bachelor's degree or 2 years' college and 4 years' experience.	GS–11	[7] 2	Yes	Completion of accredited course [8] (not less than 6 weeks) and 6 months' on-the-job training.	1. Aptitude for interrogation. 2. Thorough understanding of communism. 3. Mature understanding of human behavior. 4. Ability to maintain detached and impersonal attitude. 5. Ability to withstand job pressures. 6. Flexibility of personality and approaches to establish and maintain rapport and interview control. 7. Excellent command of English.	No applicants; yes, employees.	No	No [1]	Yes
District of Columbia Metropolitan Police Department.	Criminal	350	0	3	3,100	6	50,425	60	21	High school	No special requirement.	No set period.	Yes	Army MP school	None	Yes	Yes	No [9]	No.
General Services Administration	Security and misconduct	0	10	[10] 1	[10] 0	0										Yes	Yes	No [1]	No.
Health, Education and Welfare Department (Noninvestigative):																			
1. National Institutes of Health	Medical measurements	(11)	0	8	20,000														No.
2. Public Health Service																			
3. St. Elizabeths Hospital																			
Interior Department: U.S. Park Police	Criminal and misconduct	0	1	0		0										Yes	Yes	Yes	No.
Justice Department: Federal Bureau of Investigation.	Security and criminal	2,314	0	48	38,426	46	[12] 616,667	125	30	College degree	Special agent	No set period.	Yes	Internal, 2-weeks academic; one year on-the-job training.	1. Be recommended by superior. 2. Demonstrated excellent interrogation ability.	Yes	Yes	Yes	Yes.
National Aeronautics and Space Administration.	do	0	0	0		0										Yes	Yes	No	No.
Navy Department:																			
1. Office of Naval Intelligence	Security, criminal, misconduct, and personnel screening [3].	1,200	0	77	62,525	86	765,825	5,409	25	College degree	PG–9	1.5	Yes	Internal course (5 to 8 days).	History of meaningful interrogation experience.	Yes	Yes	No	Yes.
2. Marine Corps	Security and criminal	812	1	9	13,060	20	112,474	360	25	High school	E–5	No set period.	Yes	Army MP school	No court convictions; mental and moral stability.	Yes	Yes	Yes	No.
Post Office Department	Criminal	338	134	17	5,500	16	217,940	1,100	30	High school	PFS–13	5 to 8 years	Yes	Army MP school: Gormac, Alhambra, Calif., National Training Center of Lie Detection, New York, N.Y.	Demonstrated proficiency in criminal investigations, with special aptitude for interrogation.	Yes	Yes	No [1]	No.
State Department	Security, criminal, and misconduct.	0	17	0		0										Yes	Yes	No [1]	No.
Treasury Department:																			
1. Coast Guard	Criminal and misconduct	171	18	9	12,150	13	74,210	135	22	High school	E–5	1	Yes	Army MP School or New York Center of Lie Detection.	Selected on basis of maturity and soundness of judgment.	Yes	Yes	Yes	Yes.
2. Internal Revenue Service	Security and misconduct	0	0	0		0										Yes	Yes	Yes	No.
3. Narcotics Bureau	Criminal	0	[2] 20	0		0										Yes	Yes	No	No.
4. Secret Service	Criminal and misconduct	65	110	4	4,980	18	185,460	550	25–40	College degree	GS–9 to GS–12	5	Yes	Army MP School	Demonstrated interest and aptitude.	Yes	Yes	Yes	No.
U.S. Information Agency	Security and misconduct	0	1	0		0										Yes	Yes	Yes	No.
Total		19,796	322	512	428,066	639	4,324,919	56,290											

[1] Appeal process available for adverse personnel actions but not solely for polygraph test results.
[2] 3,494 Cuban enlistees tested in fiscal 1963.
[3] Approximate.
[4] Details in subcommittee files.
[5] No records maintained, but estimated as minimal.
[6] Same as Army (both Intelligence Corps and Military Police are attached to DASA).
[7] Not a rigid requirement.
[8] Such as Army Provost Marshal General School, internal training course, or private institution.
[9] Used only in criminal investigations, and not admissible as evidence in court.
[10] Acquired as surplus property of other agency.
[11] No statistics maintained.
[12] Only $37,000 attributable to polygraph work.

*Agency claims information restricted under 50 U.S.C. 403(g).
†Agency claims information restricted under 50 U.S.C. 402 note.

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EXHIBIT 4B—JOHN MARTIN BARRON

GS–14, Investigator General, Office of Naval Intelligence.
Born May 19, 1920, Portland, Maine.

Education

Attended parochial schools until graduation from high school in 1938. Public high school, 1 year, PG course. University of Ottawa, Ottawa, Canada, from 1939 to 1941; awarded excellence medal, English, Latin, and French, both years; 1941–43, Maryknoll Seminary, Maryknoll, N.Y., completed philosophic studies. Bowling Green State University, Ohio, from February to June 1947. Completed one semester of work toward an M.A. in English.

Military

Enlisted in the U.S. Navy as apprentice seaman in 1943. Advanced to petty officer second class, by May 1945 at which time was assigned to Naval Oriental Language School. Completed the course in Japanese language. Commissioned ensign in August 1945. Released to inactive duty in July 1946 after a tour of duty at the District Intelligence Office, San Juan, P.R. Assigned to Naval Reserve Intelligence group in 1948 and served primarily as an instructor until transferred to the Retired Reserve as a lieutenant commander in October 1958.

Employment

Entered upon employment with the Office of Naval Intelligence as a special agent on May 1, 1948. From 1950 on, in addition to investigative duties, also served as instructor at the Naval Intelligence Special Agent Schools. Promoted to assistant civilian head, Investigations Branch, 1954, and still functioning in that capacity.

Polygraph

Attended Keeler Institute, Chicago, September and October 1950; 6-week course of instruction. July 1951, initiated the Office of Naval Intelligence polygraph instructional course and has functioned as chief instructor since. Experience includes, in addition to work in all categories of investigations for the Office of Naval Intelligence, polygraph examiniations for other Federal agencies, and on one occasion, for a Senate subcommittee.

EXHIBIT 4C—THOMAS RAYMOND BECK

Thomas Raymond Beck was born in Fort Des Moines, Iowa, October 16, 1909. He enlisted in U.S. Army in 1925, served as a sergeant in the Field Artillery, Schofield Barracks, Hawaii, and was honorably discharged in 1928.

He was a member of the District of Columbia National Guard from 1939 to 1941, serving as first sergeant, Coast Artillery. In 1942, he reentered the active Army and was assigned as first sergeant of various units of the Coast Artillery, Infantry, and Military Police until 1948. He was appointed a warrant officer in 1948, and served as a criminal investigator in Germany from 1949 through 1952.

CWO Beck was Chief of Criminal Investigations, Office of the Quartermaster General, Washington, D.C., in 1953. He was assigned later in 1953 as Chief of Criminal Investigations, 42d Criminal Investigation Detachment, Jeffersonville General Depot (Quartermaster), Jeffersonville, Ind.

In 1954, he assumed command of the 45th Criminal Investigation Detachment, Fort Lee, Va. He was then assigned to the U.S. Army, Pacific, serving as Chief of Investigations for that command from 1955 through 1958.

CWO Beck was assigned to the U.S. Army Military Police School, Fort Gordon, Ga., in 1959, and was designated Chief, Polygraph Committee, Department of Specialized Instruction. He has served in that capacity to the present date.

Personal data

Date and place of birth: October 16, 1909, Fort Des Moines, Iowa.

Parents: Father, deceased; mother, Mrs. Mary Jane Beck, Route 2, Mexico, N.Y.

Marriage: Date, July 11, 1947. Wife, Elizabeth Thompson Beck. Child, Elizabeth Ann Beck.

Official home address: Care of C. Walter Thompson, Clayton, Ind.

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Education

High school general educational development test, 1953.
Criminal investigation course, Camp Bullis, Tex., 1946.
Leonarde Keeler, Inc., School of Lie Detection, 1948.
Criminal investigation supervision course, the Provost Marshal General's School, 1955.
Harvard University homicide seminar, 1955.
Instructor training course, the Provost Marshal General's School, 1959.
Polygraph transition course, U.S. Army Military police School, 1963.

Membership

Board of Governors, Academy for Scientific Interrogation, 1961 (elected for a 4-year term).

EXHIBIT 4D—FRED E. INBAU

Present position

Professor of law, Northwestern University (since 1945).

Professional experience

Positions:

Attorney at law with firm of Lord, Bissell & Kadyk, Chicago (1941–45); director, Chicago Police Scientific Crime Detection Laboratory (1938–41); member of staff, Scientific Crime Detection Laboratory of Northwestern University School of Law (1933–38) (as research assistant in legal psychology, 1933; as instructor in police science, 1934–36; as assistant professor of law, 1936–38).

Consultation:

Consultant, American Bar Foundation survey of the administration of criminal justice in the United States (1955–58).

Visiting consultant to Public Safety Division Office of the U.S. High Commissioner for Germany (summer and fall, 1951 and 1952).

Admitted to practice of law

In Louisiana (1934); in Illinois (1936).

Editorial experience

Managing director, Journal of Criminal Law, criminology and police science (since 1945).
Editor, American Journal of Police Science (1934–41).
Student editor in chief, Tulane Law Review (1931–32).

Professional organization memberships

American Academy of Forensic Sciences (president, 1955–56).
American Academy of Polygraph Examiners (president, 1954–56).
Illinois Academy of Criminology (president, 1951–52).
Member: American Bar Association; Chicago Bar Association; Chicago Crime Commission.
Honorary member: National Association of County and Prosecuting Attorneys; American Society of Questioned Document Examiners.

Education

B.S., 1930, LL.B., 1932, Tulane University.
LL.M., 1933, Northwestern University.

Publications

Books:

"Cases and Comments on Criminal Justice" (1960) (with Claude R. Sowle as coauthor).

"Lie Detection and Criminal Interrogation" (Williams & Wilkins, Baltimore, Md.) first edition, 1942; second edition, 1948; third edition, with John E. Reid (1953).

"Self-Incrimination: What Can an Accused Person Be Compelled To Do?" (Charles C. Thomas, Springfield, Ill., 1950).

"Criminal Interrogation and Confessions" (1962) (with John E. Reid as coauthor).

Articles:

Published articles (generally on criminal law and scientific evidence) in various legal and scientific periodicals.

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EXHIBIT 4E—GEORGE WAKEN LINDBERG

Name

George Waken Lindberg, 160 Pomeroy Avenue, Crystal Lake, Ill.

Profession

Attorney at law, State of Illinois; lie-detector expert (polygraph examiner).

Professional background

Received baccalaureate and juris doctor of law degrees at Northwestern University. Entered profession of lie detection in 1955, following training courses at John E. Reid & Associates, Chicago, Ill.

Professional memberships

Illinois State Bar Association and the Academy of Forensic Sciences; president of the American Academy of Polygraph Examiners and a director of the Special Agents Association.

Publications

Author of article, "The Professional Polygraph Examiner"; assisted Mr. John Reid and Mr. Fred Inbau in preparation of "Criminal Interrogation and Confessions," published in 1962.

Other professional activities

Lecturer at Northwestern University's annual short course for prosecuting and defense attorneys, newsmen in crime news analysis reporting, judges, legislators, and police chiefs. Also lectured at Northwestern University's Seminar in Scientific Evidence and Purdue University's Mercantile Police Conference and Purdue University's Arson Investigation Conference as well as before other professional groups, such as the American Society of Bank Auditors. Presently engaged in a research project with Northwestern University's bioengineers in the development of physiological recording devices related to deception and using telemetering and other advanced methods of recording physiological phenomena.

EXHIBIT 4F—JOHN E. REID

Name

John Edward Reid, 7306 North Bell Avenue, Chicago, Ill.

Profession

Attorney at law, State of Illinois; lie-detector expert (polygraph examiner) since 1940, a director of the firm, John E. Reid & Associates.

Professional background

Received LL.B., DePaul University Law School, Chicago, Ill. Trained in lie detection at the Chicago Police Scientific Crime Detection Laboratory, formerly attached to Northwestern University.

Professional memberships

Former president of the American Academy of Polygraph Examiners, a fellow in the Academy of Forensic Sciences, member of the Illinois Academy of Criminology, past president of the Special Agents Association of Chicago, member of Chicago Crime Commission, the International Association of Arson Investigators, and the Illinois Association of Chiefs of Police.

Publications

Coauthor of lie-detection text, "Lie Detection and Criminal Interrogation" and has authored or coauthored a number of law review and criminological journal articles.

Other professional activities

Conducts various short course seminars at Northwestern University and has lectured at Purdue University's Arson Investigator's School, University of Iowa, Notre Dame University, DePaul University, and the University of Puerto Rico. Devised and patented a device designed to improve the recording mechanism of the polygraph. The patent on the device, which combined with the other recording instruments, is known as the Reid polygraph.

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EXHIBITS 5A–5B—LETTER AND STUDY RELATING TO THE USE OF THE POLYGRAPH FROM THE ATOMIC ENERGY COMMISSION

U.S. ATOMIC ENERGY COMMISSION,
Washington, D.C.

Hon. JOHN E. MOSS,
Chairman, Foreign Operations and Government Information Subcommittee of the Committee on Government Operations, House of Representatives.

DEAR MR. MOSS: Pursuant to your request of March 25, 1964, there is attached a summary of the study made by the Atomic Energy Commission in 1952–53 relating to use of the polygraph.

Sincerely yours,

A. R. LUEDECKE, *General Manager.*

EXHIBIT 5A—LETTER OF JUNE 26, 1953, FROM THE ATOMIC ENERGY COMMISSION TO THE JOINT COMMITTEE ON ATOMIC ENERGY EXPLAINING AEC DECISION TO END USE OF POLYGRAPHS

Reference is made to your oral request at a recent hearing on the AEC budget for information concerning the Commission's decision to discontinue the use of the polygraph at Oak Ridge. The following summarizes the many factors which were considered by the Commission in arriving at its decision.

As you know, the use of the polygraph was introduced at Oak Ridge in the early months of 1946 when the atomic energy program was being administered by the Manhattan Engineer District. Prior to its introduction, MED officials at Oak Ridge were greatly concerned with the necessity of establishing some type of diversion control measures for use in one of the principal plants at Oak Ridge. Various physical security measures had been considered, including the use of beta meters, fluoroscopes, and physical examinations of employees. All of these measures were ruled out as being unsatisfactory for the desired purpose because of inherent weaknesses or objections from the standpoint of employee morale. Since all of the employees in the plant under consideration had received security clearance under Manhattan district regulations it was determined that the additional polygraph examination of such employees would constitute a satisfactory guarantee of the security of final product.

Although there was some opposition by the contractor to the use of the polygraph initially, it was finally accepted for use on a trial basis upon the representations of the MED security officials that the polygraph examinations would be made only to insure the security of product and information and not to duplicate the efforts of the investigative agencies in their inquiries into the character, associations, and loyalty of employees.

The contract entered into between MED and the polygraph operator was assumed by the Atomic Energy Commission when it took over the administration of the atomic energy program in January 1947. Its use has been continued for selected groups of employees at Oak Ridge until May 30, 1953, when the contract with the polygraph operator was terminated.

The Commission has studied the use of the polygraph at Oak Ridge to attempt to ascertain the real effectiveness of its use there, with a view to determine whether its use should be extended to other operations of the Atomic Energy Commission. Additionally, informal surveys of the use of the polygraph by other agencies have been made to ascertain whether or not the polygraph programs of other agencies could be adapted to the AEC security program. Finally, the Commission invited a group of recognized experts in the field of detection of deception to furnish the Commission with an appraisal of the polygraph with respect to its effectiveness in (1) determination of character, loyalty, and type of associations, (2) detection of breaches of physical security, such as pilferage, (3) detection of indiscreet disclosure of classified information, and (4) identification of undetected defectors. The following individuals served on this Panel:

Douglas G. Ellson, A.B., Ph. D., professor of psychology, University of Indiana.

Douglas M. Kelly, A.B., Sc. D., M.D., professor of criminology and psychiatry, University of California.

Eugene M. Landis, B.S., M.D., Ph. D., professor of physiology, Harvard Medical School.

LeMoyne Snyder, B.S., M.D., LL.B., Lansing, Mich., consultant to State and municipal police departments on detection of deception techniques.

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Fred E. Inbau, B.S., LL.B., LI.M., professor of law, Northwestern University; author of several works on detection of deception.

As a result of its consideration of the use of the polygraph the Panel concluded that the polygraph technique has its maximal value in the detection of breaches of physical security such as pilferage and would serve as an effective deterrent to those who might be tempted to engage in such activities. It was also concluded that its effectiveness in detection of indiscreet disclosures of classified information was less certain but that it might be a valuable aid in preventing disclosure of information and might also identify a defector provided that (1) the technique is employed by competent trained operators, (2) questions bearing upon loyalty and associations are carefully particularized to minimize the risk that the subject of the examination might become concerned about irrelevant or inconsequential collateral situations (3) adequate time is allowed not only for the actual examination but also for preliminary interviews, (4) control testing is generally employed, and (5) no attempt is made to consider the reivew of the polygraph test records as a substitute for competency on the part of the person conducting the examinations. It was also concluded that generally the polygraph technique would give accurate results in approximately 75 percent of the cases and that inroads could be made on the remaining 25 percent, depending upon the ingenuity and experience of the polygraph operator; that the probability of error in the use of the polygraph technique would be proportionate to the skill, experience, and training of the operator and the physical and mental conditioning of the subject of examination.

With respect to the detection of a subversive or defector it was concluded that the polygraph is not infallible and that positive reactions can be evaded not only by a subversive who has been trained to "beat the machine" but by a percentage of people who will lie about the most unimportant things and who cannot be detected.

The conclusions reached by the Polygraph Panel appear to be supported by studies made by the Office of Naval Intelligence and the Physical Security Equipment Agency of the Department of Defense. Quotations from the ONI Review, publication of the Office of Naval Intelligence in an article entitled, "The Polygraph: Its Capabilities and Limitations in Security Clearance," and Technical Memorandum No. 30, issued by the Department of Defense, Physical Security Equipment Agency, attached hereto, reflect the views of these two agencies on some aspects of polygraph use.

The records maintained by the polygraph operator at Oak Ridge were carefully studied during 1951 and were found to be inadequate for proper evaluation of the effectiveness of the polygraph. Thereafter a system of reporting was installed and keyed to an IBM operation. A report based on this system was considered by the Commission for the period April 1, 1952, through September 30, 1952, covering 6,058 polygraph examinations conducted at Oak Ridge during that period. This report reflected that in the 6,058 examinations there were 128 cases in which reactions has been noted, and an additional 80 cases in which the polygraph charts were evaluated as uninterpretable. Of the 128 cases in which the polygraph examinations has reflected significant reactions, the personnel security files of each of the individuals were carefully reviewed resulting in the granting of security clearance or the reaffirmation of security clearance previously granted in 102 cases. In the remaining 26 cases, of which 17 were applicants who had not been processed for investigation, admissions made during polygraph examinations reflected significant falsification of their employment application papers, which in our opinion would have been uncovered during an investigation. In these 17 cases the contractor withdrew his request for security clearance. In the remaining nine cases, admissions of minor falsifications and minor infractions of security regulations were made resulting in the individuals being reprimanded by their employers. Of the 80 cases in which the polygraph charts were evaluated as "uninterpretable," all were granted security clearance or the clearance previously granted were continued after a careful review of the personnel security files.

Of the 5,850 polygraph examinations which resulted in no significant reactions, 5,662 were checked against the investigation reports in the personnel security files of these individuals. This check reflected that in three cases the investigation had developed substantially derogatory information involving significant falsification of personnel security questionnaires which had not been detected in the polygraph examinations.

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In an "open letter" to the Commission, the polygraph operator at Oak Ridge recently made allegations purporting to show that sensational results had been achieved through use of the polygraph at Oak Ridge. It was stated that 600 out of 6,000 persons examined at Oak Ridge had falsified or withheld information from their personnel security questionnaires, that some of the information withheld concerned extensive criminal background, pertinent medical histories, and past or present membership in subversive organizations. The allegation was also made that "loose talk" violations at Oak Ridge had been reduced by 70 percent through use of the polygraph and finally it was implied that spies had not been able to penetrate Oak Ridge whereas they had penetrated other AEC installations where the polygraph had not been used.

On the basis of all the information submitted by Oak Ridge, some of which is included in previous paragraphs, it is clear that these allegations cannot be supported by statistical reports. As a matter of fact the record reflects that of 6,058 persons examined from April 1 to October 1, 1952, only 17, or less than three-tenths of 1 percent were found to have falsified their personnel documents to an extent warranting their rejection for employment, and in no case was information developed concerning an individual's past or present membership in subversive organizations.

With respect to the allegation that "loose talk" violations had been reduced by 70 percent through use of the polygraph there is no data available to support this claim. Any reduction in loose talk should not be attributed solely to the use of the polygraph but rather to our complete security program, including security education.

The allegation that "spies" have not been able to penetrate Oak Ridge because of the use of the polygraph but have penetrated other AEC installations where it has not been used is to our knowledge without any foundation in fact. Informal surveys of other agencies using the polygraph resulted in the conclusion that these programs could not be adapted to the AEC security program for the following reasons:

The personnel subjected to polygraph examinations in other agencies are either applicants for employment or employees of the Federal Government who are or will be engaged almost exclusively in intelligence and security activities, whereas approximately 92 percent of the persons engaged in the atomic energy program are employees of private firms or corporations who are engaged in a variety of duties, few of which are directly concerned with security and intelligence. Since the personnel engaged in the AEC program represent a much larger but less homogeneous group than personnel employed by other agencies, the AEC would face problems of much greater magnitude in matters relating to employee morale, personnel recruitment, and labor relations than are presently being faced by other agencies now experimenting with or using polygraph techniques.

In weighing the advantages which might accrue to the AEC security program by the use of the polygraph technique on a Commission-wide basis it was concluded that such a program could be expected to result in only an indeterminate marginal increase in security beyond that which is currently afforded by established AEC procedures for personnel, physical, and document security. Against such indeterminate marginal increase in security, consideration was given not only to the very substantial dollar costs of a polygraph program but also the intangible costs in employee morale, personnel recruitment, etc. It was concluded that such costs outweigh the benefits which might accrue to the AEC security program at this time.

In discontinuing the polygraph program at Oak Ridge the Commission has not abandoned entirely the use of the lie detector but has authorized its use in specific cases of security interest on a voluntary basis when authorized by the General Manager. The Commission has also authorized the Division of Security to continue to collect pertinent data concerning polygraph use for possible future consideration of its applicability in the AEC security program.

EXHIBIT 5B—SUMMARY OF STUDY BY AEC IN 1952–53 RELATING TO USE OF THE POLYGRAPH

During 1945, officials of the Manhattan Engineer District at Oak Ridge were faced with the necessity of establishing some type of material diversion control measures for use in building 9212 of the Y–12 area which was the final product plant at Oak Ridge. Various physical security measures had been considered,

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including the use of beta meters, fluoroscopes, and physical examinations of employees. All of these measures were ruled out as being unsatisfactory for the desired purpose because of inherent weaknesses or objections from the standpoint of employee morale. A decision was made to introduce the lie detector (also known as polygraph) for observation and recording of physical evidence of emotional stress as a means of examining all employees in the 9212 area, since it was felt that the use of such an instrument would provide the desired security check needed on these employees.

The contractor then operating the Y–12 area initially opposed the use of the lie detector but finally accepted it for use on a trial basis on the representations of Manhattan Engineer District officials that the lie detector examinations were to be made to insure the security of product and information, and not as a means of turning up irrelevant derogatory information.

A contract for the use of the lie detector, on a trial basis, was entered into on January 6, 1946, by the Manhattan Engineer District with the late Leonarde Keeler, the foremost exponent of his time in lie detector technique. The contract provided among other things for "determining, insofar as possible, the loyalty, integrity, reliability, mental stability, and suitability for employment of certain individuals at the Clinton Engineer Works, Oak Ridge, Tenn." Some 690 individuals were examined during February 1946, under Dr. Keeler's personal supervision with the following results:

Information obtained	*Number of persons*
No derogatory information developed	498
Admitted having stolen product material	9
Knowing of others having taken product material	7
Admissions of responsibility for unreported spills	11
Having knowledge of other unreported spills	8
Admissions of having stolen tools, supplies, etc	75
Having knowledge of others who had stolen tools, etc	14
Admissions of having used "aliases"	22
Thought they had given outsiders valuable information	5
Polygrams indicating emotional instability	36
Persons objecting to test	5
Total	690

Of the five persons who objected to the test, four feared that they would be questioned about their personal lives. When the purposes and techniques of the examinations were explained, the objections were withdrawn. The fifth person objected because of personal beliefs.

After analysis of the results of Dr. Keeler's tests, the Manhattan engineer district decided to continue the use of the lie detector as part of its security program for the Y–12 area at Oak Ridge. The scope of the program was limited to newly hired employees to be assigned to Building 9212 of Y–12 who thereafter would be examined annually.

Early in 1947 after the Atomic Energy Commission assumed the administration of the atomic energy program, the question of the continued and perhaps the extended use of the lie detector came under discussion. On the basis of an informal study of the experience gained under the Manhattan engineer district, it was concluded by Oak Ridge officials that satisfactory results had been obtained and its use at Y–12 was therefore continued. Consideration was then given to the possibility of extending its use to the K–25 area (gaseous diffusion plant), based upon the recommendation of the K–25 plant superintendent that it be employed at K–25 on a test basis with a view of controlling possible thefts. During the discussions at that time, it was pointed out that the use of the lie detector at either Y–12 or K–25 could not be recommended merely to duplicate the efforts of the FBI in their investigations covering the character, associations, and loyalty of employees, as required by statute, but rather that it could be effectively used at both Y–12 and K–25 to prevent or detect possible diversion of product. Since it was imperative that every practicable means be used to minimize the diversion of this type of material, it was concluded by Oak Ridge operations officials that the use of the lie detector at Y–12 and K–25 would be an added threat of discovery to anyone diverting material and would tend to deter such action. Another consideration was that in the event any material was lost by diversion, it would aid in the identification of the individuals involved.

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During the year and a half preceding July 1, 1947, approximately 2,000 lie detector examinations had been conducted at Y–12. As a result of these examinations, four persons had been denied access to the special area, but no person had been denied employment on the basis of admissions elicited during lie detector examinations. Such admissions were, however, used in the selection of individuals for discharge in any subsequent reduction-in-force.

The scope of the lie detector program at Oak Ridge was gradually expanded during fiscal 1948, until June 30, 1948, it included quarterly, semiannual, or annual examinations of the following: (1) All employees at Y–12 having access to top secret information, (2) all employees at Y–12 having access to source and fissionable material (SF) accountability records or reports, (3) visitors to certain areas, (4) vitisors to Y–12 who required access to top secret or SF accountability information, (5) protective and firefighting personnel, (6) construction workers engaged on alteration of existing structures or on new construction of vital installations within the Oak Ridge area, (7) terminal examination of Y–12 personnel scheduled for reduction-in-force, (8) initial screening of members of the AEC patrol, (9) initial screening of AEC personnel having access to top secret information, and (10) certain other employees of AEC, as requested by the chiefs of offices and divisions in which employed.

Although the use of the lie detector at Oak Ridge has been a matter of continued interest to the Atomic Energy Commission and had been the subject of periodic discussions, its use had not been extended to other AEC installations except during the period from September 1947 to April 1948, during which time approximately 640 prospective members of the Atomic Energy Commission Security Service were polygraphed during the course of their training at Kirtland Field, Albuquerque, N. Mex., prior to their assignment to duty at Los Alamos. There were no disqualifications resulting from the lie detector examinations at Kirtland Field.

The use of lie detectors was first considered by the Washington staff early in 1948, shortly prior to the time the contract which had been assumed by AEC from MED was about to expire (i.e., June 30, 1948). Before this consideration was completed, the contract was renewed by Oak Ridge Operations Office (OROO), and further study of the lie detector program was temporarily suspended. In Janpary 1950, OROO reviewed the past and present polygraph program at Oak Ridge in order to formalize a policy for general application throughout facilities under the jurisdiction of the Oak Ridge Operations Office. OROO recommended that each AEC employee and contractor employee who then had access to top secret information and/or product material be required to undergo a lie detector examination and take subsequent periodic examinations as a prerequisite to being retained on lists of persons authorized to have access to top secret information or product material, or available for assignment to a position which would require such access. On October 31, 1950, the manager of OROO extended his previous recommendations to include mandatory use of the lie detector for all personnel engaged in operations essential to the production of fissionable material at Y–12 and K–25, and for all visitors to the exclusion areas of Y–12 and K–25 in which vital production work was conducted.

The General Manager in 1951 requested an AEC staff study of the lie detector program from the viewpoint of the validity and effectiveness of the device itself in detecting deception by means of recording physical phenomena. The staff study concluded that—

"It is the consensus that the value of lie detector equipment would be least in general theoretical problems such as ideological beliefs—for example, it would be completely worthless in detecting a May, a Gold, a Fuchs—in fact, any subversive or agent who believed that what he was doing was right and did not have a real sense of guilt combined with some emotional instability. Moreover, innocent but sensitive persons will give false positive results. As a result of these studies, we believe that lie detector or polygraph examinations are not of value so far as AEC personnel security measures are concerned."

It was recommended, however, by the AEC staff that—

(*a*) For the time being, the lie detector program be continued at Oak Ridge on its present level;

(*b*) That its use not be extended until a thorough evaluation of its use is made;

(*c*) That a "polygraph research program" be established to evaluate the reliability of the instrument and to determine the incidence of its contributions to the security program;

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(*d*) That a competent consultant be employed to assist in such evaluation studies;

(*e*) That the attitude of the employees toward the use of the lie detector and the resultant personnel implications be evaluated; and

(*f*) That consideration be given to contractor versus AEC operation of the lie detector program.

Following staff discussions it was decided to establish a Panel of recognized experts to meet with Commission representatives in order that AEC might gain the benefit of their judgment on the reliance to be placed on the lie detector examination. It was hoped that the Panel would be able to suggest objective experiments by which AEC might establish a sound basis for forming conclusive judgments on the utilization of the lie detector in a security program. Those invited to participate as members of this panel, because of special competence and experience, were: Fred E. Inbau, professor of law, Northwestern University; George Ellson, professor of psychology, University of Indiana; LeMoyne Snyder, M.D., of Lansing, Mich.; Dr. Eugene M. Landis, professor of physiology, Harvard Medical School; and Dr. Douglas M. Kelley, professor of criminology, University of California.

The panel convened in Washington, D.C., in January 1952, and it was asked to give consideration to and to furnish an appraisal of—

(*a*) The present status of the lie detector, particularly with reference to its effectiveness in—

(1) Determination of character, loyalty, and type of association;
(2) Detection of breaches of physical security, such as pilfering;
(3) Detection of indiscreet disclosures of classified information;
(4) Identification of undetected defectors.

(*b*) Experiments which can be devised to give objective answers with reference to the potential value of the lie detector in accomplishing (*a*) (1) through (*a*) (4) above.

(*c*) The public reaction to and acceptance of the lie detector.

(*d*) The proper qualifications of a lie detector operator.

The panel was briefed on the use of the lie detector at Oak Ridge by Commission representatives who also took part in the subsequent discussion.

Following the panel discussion each member was requested to submit a statement reflecting his conclusions or judgments on the topics listed as items 2, 3, and 4 of the discussion outline. The discussion outline and the comments of each panel member are attached as annex "A".

The following summarizes the comments of the Panel members:

(*a*) With respect to the effectiveness of the lie detector in the detection of breaches of physical security, such as pilferage, the Panel agreed that in this area the instrument would have its maximal value, assuming that the operator is fully qualified. It was pointed out that in this particular area there is a large volume of statistical data accumulated over the years by banking institutions, department stores, etc., and that this data appears to support the view that lie detector examinations are helpful in identifying persons who have engaged in pilferage, and also serve as an effective deterrent to those who might be tempted to engage in such activity.

(*b*) With respect to its effectiveness in the detection of indiscreet disclosures of classified information and as an aid in determining the character, loyalty, and associations of an individual, the majority of the Panel were more conservative but seemed to agree that lie detector examinations might be helpful and valuable in preventing disclosures of information and might identify a potential defector, provided that—

(1) The technique is employed by competent, trained operators;

(2) The question bearing upon loyalty and associations are carefully particularized to minimize the risk that the subject of examination may become concerned about irrelevant or inconsequential collateral or associated situations;

(3) Adequate time is allowed, not only for the actual examination but also for preliminary interviews;

(4) Control testing is generally employed;

(5) No attempt is made to consider the review of the lie detector test records as a substitute for competency on the part of the persons conducting the examinations. There must be competency at all levels.

(c) There was considerable discussion as to the probability of error in the employment of the lie detector techniques and all members of the Panel were in agreement that the percentage of error would be proportionate to the skill,

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experience, and training of the operator and the physical and mental conditioning of the subject. It was agreed that the lie detector is not infallible and positive reactions can be evaded by some subjects. It was stated that not only can a trained subversive evade positive reactions, but it is also well known that there are a percentage of people who will lie and who cannot be detected. An example was an employee of a Chicago bank who had stolen a large sum of money and who had gone undetected, although subjected to periodic lie detector examinations. It was also stated that experience indicated that generally the lie detector technique would give accurate results in approximately 75 percent of the cases and that inroads could be made on the remaining 25 percent, depending upon the ingenuity and experience of the operator; that its best usefulness is as an investigative aid rather than as an independent detector of lies.

One of the Panel members further stated that the determining factor in getting positive results from the lie detector examination is whether the subject of examination has fear of being detected. He pointed out that regardless of an individual's having justified in his own mind that commission is a desirable thing and that anything he might do to advance its aims is justified, he might still be detected by the lie detector technique if he maintains some fear of being detected. Despite this observation, one member indicated that if he had to choose between the lie detector examination and an FBI investigation, he would choose the FBI investigation.

(d) With respect to experiments which could be devised to give objective answers with reference to the potential value of the lie detector in accomplishing the detection of pilferage, poor character, disloyalty or disloyal associations, or undetected defectors, the Panel appeared to agree that before any consideration is given to this question, it would be advisable to analyze the mass of data already available at Oak Ridge; that following such analysis, it might be possible to outline certain experiments; that other research data available would not be of value in the solution of the Commission's problem.

(e) With respect to the public reaction to and acceptance of the lie detector, Panel members noted that there had been some unfavorable newspaper and congressional reaction to the use of the lie detector and some of the members questioned the advisability of any wide extension of its use at that time (January 1952). The majority of the Panel were, however, in agreement that the general public had little or no real knowledge of the pros and cons with respect to the use of the lie detector. It was suggested that people should be fully informed on the usage of the instrument and that, following same there could be a fairly wide acceptance of the technique.

(f) There was a difference of opinion between Panel members as to the minimum formal educational requirements for a lie detector operator varying from at least a high school education to a medical degree. There was, however, general agreement that the following qualifications were essential: He must have a reasonable formal education, better than average intelligence, good emotional stability and desirable personality characteristics (not an introvert). He must also know how to handle people, he must know all about the polygraph machine itself and he must know something about physiology and psychology. Finally, he must also have had the benefit of individualized instruction from a competent lie detector operator.

Although the Panel was not specifically requested to render an opinion on the effectiveness of frequent lie detector reexaminations, the discussion on that subject appeared to support the view that too frequent examinations might tend to condition a subject so as to build up resistance to the detection of deception. The Panel noted that lie detector examinations at Oak Ridge have been scheduled on a quarterly, semiannual or annual basis, depending upon the position occupied by the individual, and seemed to feel generally that examinations were conducted too frequently.

On the question as to whether the lie detector program should be administered as a contract operation or as a direct AEC operation, there was a diversity of opinion among the Panel members.

In considering the advisability of establishing a lie detector program to be operated by employees of the AEC, discussion with three of the Panel members indicated that well qualified operators are in short supply. They also stated that, assuming the Commission could recruit the right type of individuals for the operation of its lie detector program either from within or outside its own organization, a minimum of 6 months intensive training would be necessary before such individuals would be considered competent to operate in the Commission's program.

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On the basis of the Panel discussion, the following conclusions reflect the views of the majority:

(*a*) The lie detector techniques, insofar as applicable to the AEC security program, are still in a pioneering stage;

(*b*) The effectiveness of lie detector examinations is directly dependent upon the competency and integrity of the operator. (Adequate time must be taken not only for the conduct of the examination itself but also for the preliminary interview and interpretation of the examination record.)

(*c*) Too frequent lie detector examinations may well minimize their effectiveness in the detection of deception;

(*d*) The lie detector is not infallible. Published material reflects that the accuracy of the machine itself in criminal investigation is on the order of 75 percent, but in some programs with highly skilled operators, the percentage of known error has reportedly been reduced to 1 percent;

(*e*) The lie detector is an effective aid to investigation;

(*f*) The lie detector examinations, through admissions or statements obtained from the subject of examination, is a valuable aid in the detection of pilferage;

(*g*) The lie detector technique may serve as a psychological deterrent to the disclosure of classified information to unauthorized persons and also as a deterrent to pilferage;

(*h*) The lie detector may not disclose intent to commit espionage or sabotage nor detect the subversive who is trained to evade detection by this technique;

(*i*) Lie detector tests as conducted at Oak Ridge are believed to be given too frequently, and the time allocated for each examination is inadequate;

(*j*) Unfavorable reactions may be expected should there be any sudden, large-scale expansion in the use of the lie detector in the atomic energy program primarily because of the general lack of knowledge concerning this type of testing. Adequate orientation of personnel engaged in atomic energy work with respect to the use of lie detector techniques could result in its acceptance by a large percentage of such personnel;

(*k*) It is desirable that a lie detector program be operated by employees of the Atomic Energy Commission;

(*l*) Competent lie detector operators are in extremely short supply and the transition from contract operation to direct Atomic Energy Commission operation of a lie detector program would involve a period of several months, necessitated by the recruitment and training of operators in the use of lie detector techniques.

(*m*) The identity and reconstruction of case records at Oak Ridge, by which the contribution of the lie detector to the security program might be demonstrated, is dependent to a large degree on the memories of individuals concerned. Any evaluation of the Oak Ridge program at this time depends on individual opinion due to the absence of acceptable statistical data.

Although the lie detector technique may be a valuable adjunct in a security program, the AEC, as of the date of the Panel discussion (January 1952), did not have an adequate basis for evaluating the effectiveness of the lie detector program as conducted at Oak Ridge.

The examinations at Oak Ridge were conducted in a minimal period of from 20 to 30 minutes during which the person to be examined was given a brief explanation of the manner in which the lie detector is used and was apprised of the nature of the questions which would be asked. Then followed two separate examinations on the lie detector with provision being made for further examination and use of supplementary questions if reexamination was indicated. The lie detector operators did not have available to them the reports of the background investigation and reportedly did not use the AEC personnel security questionnaire.

All members of the Panel agreed that lie detector examinations conducted in a 20- to 30-minute period did not allow for proper orientation of the persons to be examined or for the proper conduct of the examination itself. The observation was also made that compensation for a lie detector program based upon a unit price might have a tendency toward mass production and thus minimize the effectiveness of the lie detector techniques.

A report on the Oak Ridge polygraph program for the period April 1, 1952, through September 30, 1952, reflects that 6,058 polygraph examinations had been conducted at Oak Ridge during the 6-month period and had resulted in 128 cases in which significant reactions had been noted. In an additional 80 cases the polygraph charts were evaluated as uninterpretable. Of the 128 cases in which

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the polygraph examinations had revealed significant reactions 102 were finally granted clearances or the clearances previously granted were continued after a review of the reports of investigation. Information developed by the polygraph examinations in the remaining 26 cases was as follows:

One request for emergency clearance was withdrawn on admission of two arrests for drunkenness which had not been included in PSQ. This individual later was granted Q-clearance after evaluation of investigation reports.

One individual was denied access to building 9212. Polygraph examination developed admissions of arrests which had not been included in PSQ but which had been developed in background investigation. The Q-clearance previously granted was continued.

In seven cases the employees made admissions of violations of security regulations which resulted in their being reprimanded by the contractor.

In the cases of 17 applicants, the contractor withdrew his request for security clearances as a result of admissions made during polygraph examinations. In 14 of these cases the applicants admitted significant arrest records which had not been included in their PSQ's. Two other applicants for professional positions at K–25 admitted knowing and associating with known Communists and one applicant for semiskilled position at K–25 believed in the causes which have been supported by the Communist Party in the United States.

Of the 80 cases in which the polygraph charts were evaluated as uninterpretable all were granted clearances or the clearances previously granted were continued after a review of the reports of investigation in the personnel security files.

Of 5,850 examinations which resulted in no significant reactions, 5,662 were checked against the investigation reports in the personnel security files of these individuals. This check revealed that in three cases the investigation had developed substantially derogatory information involving significant falsification of the personnel security questionnaires which had not been detected in polygraph examinations.

In endeavoring to arrive at an AEC policy for the use of the lie detector in the AEC security program, consideration was given to the advisability of extending the lie detector program as operated at Oak Ridge for commissionwide usage; the adaptation of other Federal agency polygraph programs to the AEC security program; or the adoption of a limited lie detector program for application to especially sensitive areas and activities at all AEC installations.

Other Federal agency polygraph programs in effect at that time were rejected for adaptation to the AEC security program for the following reasons:

(*a*) The personnel subjected to lie detector examinations at other Federal agencies were either applicants for employment or employees of the Federal Government who were or would be engaged almost exclusively in intelligence and security activities, whereas approximately 92 percent of the persons engaged in the atomic energy program were employees of private firms or corporations and not engaged in such activities. Since the personnel engaged in the AEC program represented a much less homogeneous group than the personnel employed by other Federal agencies it was obvious that the AEC would have to face problems of much greater magnitude in matters relating to employee morale, personnel recruitment, and public and labor relations. Moreover, application of such programs to the AEC security program on a broad basis would have resulted in substantial costs. It was doubtful that such costs would be warranted from the security standpoint.

(*b*) A limited lie detector program directed at only a small percentage of the participants in the atomic energy program who were engaged in particularly sensitive areas or activities would similarly entail large expense for the purchase of equipment, selection and training of operators. Such a program did not appear to be sufficiently effective from a security viewpoint to warrant the expenditure involved. If an attempt were made to infiltrate the atomic energy program, it was reasonable to conclude the subversives who might be introduced would not apply for positions in the sensitive areas and activities in which the lie detector would be used, but rather they would seek to infiltrate important but less sensitive fringes.

In weighing the advantages which might accrue to the AEC security program by the use of the lie detector techniques on a Commission-wide basis, it was obvious from the experience gained at OROO that a lie detector program could be expected to result in only a marginal increase in security beyond that which was currently afforded by established AEC procedures for personnel, physical,

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and document security. Against such indeterminate marginal increase in AEC security it was necessary to weigh not only the dollar costs of a lie detector program, but also the intangible costs in employee morale, personnel recruitment, labor, and public relations. It was concluded that these costs outweighed the benefits which might accrue to the AEC security program at that time.

On the basis of the foregoing the Commission in March 1953 approved the discontinuance of the use of the polygraph in the AEC security program except in specific cases of security interest on a voluntary basis and upon specific authorization by the General Manager to assist him in the resolution of particularly difficult personnel security cases.

ANNEX A.—DISCUSSION OUTLINE FOR LIE DETECTOR PANEL MEETING AND COMMENTS OF PANEL MEMBERS

DISCUSSION OUTLINE FOR LIE DETECTOR PANEL MEETING

(1) *Orientation.*—(*a*) General outline of the AEC security program and problems related thereto.

(*b*) Use of the lie detector in AEC.

(2) *Appraisal by the Panel.*—(*a*) Of the present status of lie detection, particularly with reference to its effectiveness in—

(1) Determination of character, loyalty, and type of association.
(2) Detecting breaches of physical security; such as pilfering.
(3) Detecting indiscreet disclosures of classified information.
(4) Identifying undetected defectors.

(*b*) As to experiments which can be devised to give objective answers with reference to the potential value of the lie detector in accomplishing (*a*)(1)–(*a*)(4) above.

(3) Appraisal by the Panel of public reaction to and acceptance of the use of the lie detector.

(4) Suggestions by the Panel as to the proper qualifications for operators.

COMMENTS OF PANEL MEMBER NO. 1

With regard to the specific questions raised with regard to 2(*a*) (1), (2), (3), (4) of the outline, it is my opinion that the lie detector technique can be very useful and very helpful for the purposes stated, provided, however, that—

(1) The technique is employed by competent, trained examiners.

(2) Questions bearing on such general problems as "loyalty," "disclosures of classified information," etc., are carefully particularized so as to minimize the risk of the subject being concerned about an irrelevant or inconsequential collateral or associated situation.

(3) Adequate time is allowed, not only for the actual mechanical testing, but for the preliminary interview, etc.

(4) Control testing is rather generally employed.

(5) No attempt is made to consider the review of lie detector test records by a competent examiner as a substitute for competency on the part of the person conducting the test. The technique requires competency at all levels.

With regard to 2(*b*), I do not know of any laboratory or experimental testing that will furnish objective answers to the questions raised in 2(*a*).

As to (3), it is my opinion that the public by and large believes that the technique is reliable, but they are concerned about the encroachment it may bring upon their individual liberties and privileges.

Regarding the qualifications for operators or examiners, I refer to volume 40 of the Journal of Criminal Law and Criminology at pages 791–795 (1950), particularly at page 793. (A copy of that article is attached herewith.)

SOME AVOIDABLE LIE DETECTOR MISTAKES

(Reprinted from the Journal of Criminal Law and Criminology of Northwestern University, vol. 40, No. 6, March-April 1950, Fred E. Inbau)

The most competent lie detector examiner may and does make mistakes, and in a certain percentage of his cases he is unable to arrive at a definite opinion as to whether his subject is telling the truth or lying. Nevertheless, many lie detector errors and inconclusive test results are avoidable ones. The factors

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which generally account for this latter group may be briefly stated as "unfit subjects" and "unqualified examiners."

Subjects unfit for testing

Most lie detector errors and inconclusive test results are attributable to the incompetency of the examiner conducting the test. In many instances, however, they are properly chargeable to a prevailing practice whereby otherwise qualified examiners will accept for test purposes subjects who have been rendered unfit for any such testing because of the treatment they have encountered at the hands of police investigators before being presented for lie detector tests.

No one in his right mind would expect a medical technician to conduct a satisfactory metabolism test on a patient who had just emerged from a fist fight or who had been chased up a flight of stairs or who had been verbally abused and threatened while on his way to the examination room. Yet the thought apparently seldom occurs to some police investigators that a person may be rendered unfit for a lie-detector test by an extensive interrogation based upon frequent and constant accusations of guilt. In many of these instances, the lie-detector examiner is unable to make a diagnosis that he considers reliable; his report is "indefinite" or "inconclusive," and so the press report reads too. In cases where the extensive interrogation is accompanied by actual physical abuse, the positive suggestions of guilt constituting part of the "third degree" procedure may produce test reactions which will simulate true deception criteria in an innocent person's record. There is at least one such case in which this actually happened. The same pretest experience also may so condition a guilty subject that his enmity toward the investigators becomes the center of his thinking rather than the offense itself, and the ordeal may actually relieve him of whatever mental conflicts are present because of his criminal act. In this event it is highly probable that a "third degree" victim's deception may not be detected by the lie-detector technique, and another lie-detector failure will probably find its way into the press reports.

Any testing which is attempted under the conditions just described is unfair to the lie-detector technique and to the examiner as well.

Experience on the part of competent examiners who restrict their practice largely to personnel investigations indicates that their percentage of accuracy and of definite reports far exceeds that of examiners in police cases. The difference may be attributed in large part to the fact that the personnel investigator's subjects are in much better condition for their tests. They have not been physically abused or extensively interrogated.

What can the police-employed, lie-detector examiner do to remedy the present situation? Three things:

(1) Establish a practice of refusing to test a subject who has been physically abused.

(2) Where the circumstances are in the extreme, refuse to examine a subject who has been extensively interrogated, even though no direct physical abuse has been administered.

(3) Try to develop a procedure within the particular police department whereby lie-detector tests will ordinarily be conducted during the early stages of an investigation or interrogation rather than as a last resort when all else has failed.

To some persons these suggestions may appear to be naively conceived. They will say that only a very unrealistic individual will expect a lie-detector examiner who is working in or for a police department to adopt such an attitude and survive the consequences. In the writer's opinion, however, a person who does not have the necessary courage or the ability to meet the situation is unfit for the role of lie-detector examiner.

The basically unqualified examiner

In assessing the qualifications of a lie-detector examiner, it must be remembered that his task is not simply the manipulation of an instrument; as a matter of fact the actual operation of the instrument itself requires very little ability or training. The examiner's most important task and responsibility consists of the diagnosis of deception from an examination and study of the physiological changes recorded by the instrument. Along with his skill in that respect, however, he must be able to perform the next most important task—the skillful interrogation of a guilty subject with a view toward obtaining a confession of his guilt.

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To qualify for this twofold assignment, an examiner need not be a physician or a psychologist, but he must be an intelligent person with a reasonably good educational background, preferably college training. He should have an intense interest in the work itself, a good practical understanding of human nature generally, and suitable personality traits which may be evident from his otherwise general ability to "get along" with people and to be well liked by his friends and associates. Unless he has these qualifications, no amount of training or experience will permit him to produce very satisfactory results either as regards the accuracy of his deception diagnosis or his record for confessions obtained from guilty subjects.

Many persons now functioning as lie-detector examiners do not possess these basic qualifications. They should never have been encouraged to embarked upon such a career. Unfortunately, however, a number of estabilshed examiners have conducted schools for trainees and have followed a practice of accepting as students practically anyone who applied with the necessary tuition fee or who had been selected by his own police department or governmental agency to attend the school at his employer's expense.

A person without a better-than-average intelligence, a fair educational background, and a good practical understanding of human nature generally, will inevitably make more mistakes than a trained individual with the necessary basic qualifications. The basically unqualified examiner is the one who in view of his own personal shortcomings will feel impelled to make a definite diagnosis in practically every case, and for that reason is more likely to make outright mistakes. To him an indefinite report is an admission of personal failure. He is also less likely to succeed in private practice as a lie-detector examiner if he makes such an attempt, and with a realization of impending failure he will be more receptive to rendering opinions favorable to that side in a controversy or investigation which is prepared to pay the higher price for a suitable opinion.

No experienced examiner who values the status of the lie-detector technique or his own reputation should accept for training at whatever the price may be, individuals who are basically unqualified.

Inadequate training

Although it is possible for a person with proper basic qualifications to ultimately develop into a competent examiner after several weeks of intensive study, instruction, experimentation, and actual case observations, the desirable minimum period of training is about 6 months. During that time his course of study should include readings and instruction in the pertinent phases of physiology and psychology; frequent observations of an experienced examiner working on actual cases; personal experience in experimental case testing and actual case testing under an instructor's supervision; and the examination and interpretation of a considerable number of records in solved cases. His course of training should also include instruction, as well as observational and personal experience, in the application of psychological tactics and techniques for obtaining confessions and other helpful information subsequent to the testing of untruthful subject.

Regardless of the time element, however, adequate training cannot be given by an instructor to more than about six persons at a time. The student in larger groups cannot acquire the necessary practical experience or receive the individual attention required from the experienced examiner. Here again, therefore, is a prevailing practice that should be modified in the interest of better examiners and fewer mistakes.

During and after any course of instruction the student should be made to realize fully that the technique is subject to limitations and that he should not represent it to agencies utilizing his service as possessing any infallibility in its indications.

Some branches of the armed services have used and are perhaps still using as examiners certain individuals who are basically unqualified and improperly trained. They have at times conducted tests—and on a large-scale basis at that—upon persons whose loyalty was under scrutiny, and in many instances the reports of these examiners appear to have been accepted at face value and upon the assumption that the technique produced results approximating perfection. For the future welfare of this Nation, let us hope that somewhere along the line of persons responsible for the security of our secret weapons or of any other project or interest of national importance there develops a realization that the dependability of lie-detector test results is no greater than the qualifications and ability of the examiner itself. Moreover, there should be an awareness that even as regards a highly qualified examiner mistakes are still a possibility.

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The need for specialization

Mastering the lie-detector technique is no simple matter. It requires much time and effort. In fact it requires all of one's working time and energy. An examiner cannot do justice either to the technique or to himself if one day he is a chemist, or a firearms expert, and the next day, or hour, he functions as a lie-detector examiner. Moreover, the personality requirements for a lie-detector examiner are vastly different from those of laboratory technicians generally. As a rule the man who is good with the microscope or chemicals either does not have the required interest in testing and interviewing people or else he lacks the essential personality characteristics. By this suggestion no reflection is intended, of course, upon the laboratory technicians; in fact, the situation is no better when reversed. The capable lie-detector examiner is usually a misfit when he tries to work in these other fields.

It is a mistake, therefore, for any police department to assume that laboratory personnel can be readily shifted from a chemistry section or a firearms section into the laboratory's lie-detector unit. It is also unwise for an individual to attempt ot shift back and forth from the one type of work to the other. He should realize quite early in his career that the lie-detector technique like the profession of law, is a "jealous mistress." It will demand and require his undivided attention.

Conclusion

The lie-detector technique, when properly used, is an invaluable investigative aid; and it is being so used by a number of very able examiners. At the same time, however, we must recognize the existence of certain objectionable practices which retard the progress of the technique and contribute very materially to the making of otherwise avoidable mistakes. Only by a recognition of these shortcomings and a frank discussion of the problem can we invoke the necessary corrective measures.

COMMENTS OF PANEL MEMBER NO. 2

In answer to your query, I submit the following statements:

Concerning item (2), it is my opinion that the present status of lie detection is of value in determination of character, loyalty, and type of association only if used with very specific nonabstract questions. In this area it will probably be least successful unless sufficient time is allowed to permit the operator to evaluate positive responses which result from ambiguity or uncertainty in the question rather than lack of loyalty in the subject. I would think that the polygraph would be of great value in this area providing a good operator and ample time were allowed. Since this is the most difficult area of investigation, individual questions would have to be set up and large masses of employees would be difficult to screen. An approach to the problem, however, could be accomplished by the techniques now in use at Oak Ridge of using a standard, well-formulated questionnaire and then employing the polygraph to pick up falsification of data. This should certainly work with large groups as a preliminary screen. All records showing emotional reactions suggestive of potential falsification could then be rechecked as independent runs. Such a process would protect the individual and also permit an efficient use of the polygraph. It is my definite feeling that the polygraph is of value in this area.

The second phase, detecting breaches of physical security such as pilfering is an area of maximal value for the polygraph. It has been shown to be of definite use in banks, etc., and should certainly work here with high efficiency.

The third phase would again involve the use of carefully worded nonabstract questions, and it is my opinion that here the polygraph would be more important as an aid to interrogation rather than used by itself. Ambiguous questions, secondary evaluations of the subject, uncertainty as to potential disclosures, etc., might well produce false positive results. As in the first problem, the errors would tend to be on the positive side, requiring further questioning so that mass checks would be difficult.

The Panel apparently was in fair agreement that solution to the previous three problems would tend to solve the fourth one. Certainly here routine polygraph checks such as are in use at Oak Ridge with recheck of any peculiar results would be of considerable value as preventive techniques and in uncovering an occasional defector.

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From a practical point of view, it would seem most reasonable to use the large amount of data accumulated at Oak Ridge before setting up any new specific experiments. A survey of the records with checks on the individuals should certainly yield information on the value of the technique. Once a clear notion was gained what has already been done, further experiments could be set up, but it is my feeling that such studies would be wasted at present as they might well turn out to be duplications of the Oak Ridge findings. I would recommend a comprehensive appraisal there before anything else is undertaken.

The question of public reaction could also be studied at Oak Ridge, and a trial study might be made at any other center where the polygraph is not now employed. A public relations study could be undertaken and it would be most interesting to see whether or not the method could be "sold" by an education campaign as to its precise functions and the technique used by AEC to protect all employees from any potential false positives. It would be my definite opinion that such an educational program could be easily established and with the system of safeguards already in effect at Oak Ridge where the polygraph operators seem to have set up a workable method, public reaction could be swung in favor of the method. It would be very interesting to see a technique of this type tested in any other laboratory area. I have personally discussed the question with a few physicists here at the university and after a bit of conversation have never had any scientist react in any way adversely.

As far as qualifications for an operator are concerned, it is my belief that such individuals should be of course well trained in method, have a good background in physiology and psychology, be expert interrogators and have adequate emotional stability themselves. These qualifications are, of course, utopian, and I think the Oak Ridge method shows pretty well a practical solution in using routine operators with a followup personal check of any dubious record. This puts the expert where he should be, focusing his time on the more complex

COMMENTS OF PANEL MEMBER NO. 3

I am sending these comments along with the hope that you will recognize that they can only be a "personal impression" and are not to be rated as heavily as comments you will receive from those more familiar with "lie detector" equipment and its operation.

(1) Appraisal by the Panel as to present status of the effectiveness of the lie detector.

"Lie detection" appears to me to be an experimental technique, the effectiveness of which apparently depends upon (*a*) the expertness and experience of the interrogator, (*b*) a "buildup" prior to the test, (*c*) certain control runs and (*d*) an empirically chosen series of tracings which are useful but still not proved to be the best available at the present time. In the "buildup" the skillful operator must arrange conditions with great care if maximum usefulness of the technique is to be obtained.

It seems that the major usefulness of this procedure, granted proper preparation of the interrogator and his subject, lies in prevention of pilferage (through fear of detection) and in extracting confessions of past transgressions (again by instilled fear of the technique or by demand for confession based on the interrogator's interpretation of the records). I find it impossible myself to come to any objective appraisal of the general usefulness of this technique until more is known concerning (*a*) control studies to indicate effects of individual variations in vasomotor control, emotion, etc., (*b*) comparison between external detection (as used by the FBI) and lie-detection procedures, and (*c*) usefulness of some of the more sensitive methods of studying somatic responses to emotion, for example electromyograms, direct blood pressures, cardiotachometers, digital plethyamographs, skin color, etc., etc. As long as the importance of the "operator" is as overwhelmingly great as it is at present, appraisal would have to be divided into three stages (*a*) the apparatus alone, (*b*) the interrogator alone and (*c*) both together. To me it seems that any objective appraisal is impossible at the present time.

(2) Appraisal of public reaction, etc.

I doubt whether the public at large should be asked now to accept the blanket required use of the lie-detector technique, except under very special conditions, e.g., those in highly secret areas. Aroused public opinion could immediately point to its dependence on the operator, its fallibility and its present experimental state. But it is also true that this public reaction might change almost overnight if a sudden emergency arose, e.g., involving national survival against an invader.

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One would hope that by the time such an emergency does arise, a great deal more objective information will have been obtained, so that the methods eventually adopted will be far superior to those now available. One would hope, too, that skillful management might in the meantime change the designation of this procedure from its present unfortunate title of "lie detector" to something like "truth indicator" to avoid the negative and irritating implications of a presumed lie and its detection.

(3) Suggestions as to qualifications for operators.

If the general technique is to be extended from the presumptively criminal or at least definitely suspected group, to large numbers of presumptively innocent and honest individuals, the issuing of derogatory reports should be the responsibility of professional specialists with a clear and approved record of training in psychology, physiology, and medicine. Technicians and technical screening operators would thus have limited responsibility—but final and full responsibility to the individual tested would rest with the professional head of the group. This is analogous to the X-ray specialist who assumes complete responsibility for the work of his technicians, or to the professional head of a hospital laboratory, who assumes complete responsibility for the analyses reported by his laboratory. With this arrangement, the training of technicians can be most clearly separated from the qualifications of the professional supervisors and the responsibilities which widespread use of "truth indicators" will require.

COMMENTS OF PANEL MEMBER NO. 4

The present status of lie detectiom

Research on lie detection indicates that with the aid of one or more physiological response recording devices, it is possible to detect deception, or at least to obtain information which an individual being examined has reason to hide. However, there still exists a considerable uncertainty about the answers to two basic questions which are extremely important in making decisions as to policies involving the use of so-called lie detectors. These are:

1. To what extent may any success of these procedures be attributed to the instrument rather than to the skill of the operator in interrogation and interpretation of response records provided by the instrument?

(2) What is the nature and magnitude of the errors in conclusions reached by means of "lie detection" procedures?

The answer to the second of these questions depends very much on the answer to the first. If the success of lie detection procedures depends primarily upon the instrument, it is possible to obtain a meaningful estimate of the errors to be expected. On the other hand, if the results obtained with these procedures are largely a function of the skill of the operator, we are in a poor position to make any general statements about the errors to be expected. The reason for this is that the machines can be duplicated with sufficient uniformity that measures of error made with one machine or with a small sample of such machines can be expected to be repeated when similar machines are used at different times and in different places. The human operators, however, no matter how uniform and extensive their training, can be expected to differ from each other tremendously, so that the errors found in a research study designed to evaluate "the effectiveness of lie detection" using one or even a small sample of available operators would provide little reliable information concerning the performance to be expected from any other operator.

The situation is similar to the measurement of body temperature for medical purposes. The uniformities possible (and insisted upon) in the manufacture of clinical thermometers make it possible to obtain precise estimates of the errors which may be expected in the measurement of temperature, even when the measurements are made by relatively untrained personnel. If, instead of the thermometer we had only an instrument which amplified the patients' skin temperature and transmitted it to the fingertips of the doctor, and which required several years of training to learn to utilize, estimates of the error to be expected when a single doctor "measured" the temperature of a single patient would be very tenuous. If there is one aspect of the behavior of human beings about which we are certain at the present time, it is the variability of their performance, even when they are given "identical" training.

At the present time, those who are acquainted with the use of the "lie detector" in practical situations for the detection of deception seem to agree, either explicitly, or implicitly in their insistence on a long period of experience and train-

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ing for the "lie detector operator," that the skills of the operator are a major determiner of the results obtained. Some apparently would go as far as to say that the instrument is little more than a stage prop for the interrogator.

Much of the early research on the use of response-recording instruments for the detection of deception suggested procedures for the measurement of specific aspects of responses which reduced the "human factor" or skill of the operator to a minimum. Whether these routine procedures were "too much trouble," whether inflexible laboratory interrogation routines could not be adapted to the practical features of specific cases, or whether the laboratory measurements were otherwise ineffective outside the laboratory is not known, but it is very clear that current practice in the detection of deception ignores these objective methods and relies very heavily on the skill of the operator in interrogation and in some unspecifiable but complex and subjective evaluation of the information provided by the "lie detector" instrument. This is true not only in general police practice, where each case differs from every other so that the inflexible laboratory routines are perhaps impossible to duplicate, but also in routine screening checks such as those proposed by AEC, where the routine procedures and specifiable measurements shown to be effective in the laboratory are best adapted.

So long as procedures for the detection of deception depend to such a great extent upon the human operator of long experience and training but of unmeasured skill (and perhaps unmeasurable skill under the practical conditions under which these procedures must operate) no reasonably accurate and meaningful statement of the errors to be expected can be obtained, especially when it is remembered that these procedures are almost necessarily applied to an individual case by a single operator.

Proposals for research

The considerations discussed under the above section suggest two general types of research on problems of lie detection. One type would be the determination of the errors to be expected from a single operator. The results of this research would provide information only on the performance of that operator to be expected when he was working with cases, procedures, and instruments highly similar to those examined in the research. This research could be strictly comparable to the calibration or performance checks routinely applied to mechanical and electrical devices, but seldom applied to the human operators of these machines.

A second type of research would be concerned with the investigation of the effectiveness for detection of deception, of objectively specifiable measurements of the response records obtained from instruments similar to those called lie detectors. This research, in addition to the substitution of objective measurements for aspects of responses which can only be recorded by means of highly complex and subjective judgments, would also substitute specifiable weighting and mathematical procedures for combination of response measures into single indices. Some of the early research utilized objective measurements, but little or nothing was done on procedures for combining those objective indicators.

At the present time a research project sponsored by the Office of Naval Research at Indiana University is concerned with this type of investigation of objective indicators singly and in combination. This project has been operating for only a very short time. Results from the first year's work were not promising, but more recently there are some indications that effective procedures which do not depend on highly fallible types of human judgment may be possible.

A third type of research might be described as basic research on the nature of the physiological and psychological processes involved in attempted deception. Little research has been performed on the detection of deception during the last 20 years, and consequently information accumulated in the fields of physiology and psychology during this period has not been applied to these problems. Support of relatively unrestricted basic research on hypotheses related to deception might well lead to a few new ideas in this field.

Appraisal of public reaction to the "lie detector"

Any comments I may make on this subject are almost pure guess. I believe that the public has very little real information about the lie detector. As is usual when there is little information, there are wide differences in opinion (as to its value and acceptability). While the range of opinion is very wide, I would guess that at the present time most people are just not interested, and any opinion they might express would not be very intense. Under these conditions public opinion could be swayed in either direction, for or against, by

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anyone who wished to sway it for reasons of his own. The available evidence in the form of research reports and opinions of the "experts" who use the lie detector is scanty and of such a nature that it could be ignored, or in many cases used to support either a "pro" or a "con" approach. And, since the use of the lie detector seems to have implications for the personal integrity and human rights of members of our society, negative fluctuations of public attitude toward it might well result in strong action.

Suggestions for qualifications for operators

If, as I have suggested above, current practice requires the lie detector operator to be a skilled interrogator, able to detect deception from subtle aspects of the examinees' verbal, bodily, and instrumentally recorded response, and to use this information in modifying his approach to the interrogation, then any speculation by me as to the qualifications for this work would be of less value than those of someone intimately concerned with this practice. However, I would suggest that a man's qualifications for such a job might be determined by some index of his success in detecting deception, obtaining information or confession from a suitably selected sample of cases. See the "calibration" procedure suggested in the second section, "Proposals for Research," above.

COMMENTS OF PANEL MEMBER NO. 5

Assuming the properly qualified examiners are employed, I believe the polygraph technique is a valuable method of determining loyalty, character, and all other factors which may affect an employee's desirability as a security risk. To my mind, the chief problem is in obtaining properly qualified examiners. In general, it should not be necessary in most instances to train people from scratch who have had no experience whatever in the field of scientific interrogation. There are a considerable number of people who are basically well qualified for this work but who need some more closely supervised instruction. If these persons can be found it would save considerable time and trouble in producing personnel that are well qualified for this particular task.

In any operation of this kind there should be provision for routine repeat examinations at intervals of not greater than 1 year and this should keep pilfering and disclosures of classified information to a minimum. That has been the universal experience where the polygraph technique has been employed by banks and other similar businesses.

If the proper approach is made, I don't believe there will be much difficulty in getting public acceptance to the use of this method. People generally realize the extreme importance of maximum security in a project of this kind and will accept it without question if they are convinced of its usefulness. I believe it advisable to use the words "lie detector" as little as possible and instead employ such terms as "personnel examination," "security examination," or some similar title. Experience during the last 20 years has shown that when routine examinations were run on personnel in industries, while there may have been some resentment, when it was inaugurated it quickly disappeared and the employees accepted it without protest.

I am enclosing a copy of a letter I wrote to Dr. Warren on January 30, 1952, which I believe covers my belief about other phases of the subject. Also I am returning copy No. 3 of the transcript.

JANUARY 30, 1952.

Dr. SHIELDS WARREN,
Atomic Energy Commission,
Washington, D.C.

DEAR SHIELDS: Since our meeting of last week, I have had an opportunity to review in my mind the various problems discussed, and I thought it might be useful to you and the other members of the panel to state my views on the subjects discussed.

(1) I believe that the survey of the screening tests conducted at Oak Ridge, Tenn., by means of the polygraph technique have been worth while and should be continued.

(2) It is my recommendation that these tests should be conducted by the Atomic Energy Commission itself and not be done by an outside agency on a contract basis. (This represents a change in my views from those I expressed at the meeting in Washington.)

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(3) If the screen tests are to be conducted by an outside agency, I believe the tests should be conducted by persons on a salary basis rather than on the basis of a stated amount per examiation.

(4) I do not believe that any polygraph examiner should have any final decision in the hiring or discharging of any employee, but his recommendation should be used in conjunction with other information which is made available to the Commission.

(5) It is my opinion that the usefulness that the polygraph technique has demonstrated at Oak Ridge could well be extended to other operations under the control of the Atomic Energy Commission.

(6) Based on my knowledge of similar situations, it is difficult for me to believe that the use of the polygraph screening technique will make it more difficult to acquire desired scientific, highly trained personnel.

May I again thank you for including me in on this panel discussion. It was a genuine pleasure to see you again and I hope that we can meet in the near future.

EXHIBIT 6—THE BACKSTER SCHOOL OF LIE DETECTION POLYGRAPH EXAMINER TRAINING COURSE

The steady growth in the utilization of the polygraph by more and more leading law-enforcement agencies has demonstrated the necessity in this country for more schools that teach a thoroughly modern and effective polygraph examiner training course.

The polygraph examiner training course is designed to provide such training. The main areas of study include polygraph instrument considerations, physiology and medical aspects, applied psychology, polygraph question formulation, polygraph examination techniques, polygraph chart interpretation, polygraph interrogation techniques, Backster standardized polygraph note pack, polygraph examination observation, polygraph practice exercises, related polygraph instruction, and a field work project.

Having completed the polygraph examiner training course, the graduate should be able to conduct valid basic polygraph tests and interrogations. He should know what human and mechanical factors must be taken into account and what polygraph techniques and procedures he will have to follow because of these factors. The graduate should be able to conduct preemployment, routine screening, specific, criminal, and inventory-shortage examinations with confidence.

The graduate who is not with a law-enforcement agency will be able to enter the field of lie detection. The law-enforcement graduate will not only be entering a new field, but he also should be able to advance further and faster in his department because of this training.

POLYGRAPH EXAMINER TRAINING CURRICULUM

A. Polygraph instrument considerations

The aim of this course is the study of the breathing, galvanic skin response, and cardiorecording units of the polygraph. Extensive adequate practice is provided. Also taught will be basic polygraph maintenance and repair. (18 hours.)

B. Physiology and medical aspects

This course section provides for the study of physiological principles as related to the cause for changes in each of the three fundamental tracings associated with standard polygraph examination procedure.

Aside from the physiological aspects of the breathing pattern, GSR pattern, and cardio pattern, the effects of drugs on polygraph testing is discussed, along with a suggested method to determine such use of drugs.

Basic physiology is revised to the extent of a condensed summary of the respiratory system, cardiovascular system, and the nervous system. (12 hours.)

C. General and applied psychology

This course section provides for the study of psychological principles as related to the overall environment surrounding the average polygraph examination and it's effect on the specific principles oif psychology which are strongly relied upon as the very basis for modern polygraph techniques.

This section relates psychology to polygraph interrogation, classified subject behavior as related to abnormal psychology, and also review existing psycho-

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logical tests currently recommended for preemployment screening as well as those tests recommended for the criminal suspects. (9 hours.)

D. Polygraph question formulation

This course section strongly emphasizes scientific selecting of the strongest possible examination target through evaluation of intensity, adequacy of available information, and distinctness of issue.

Also emphasized are strict rules governing the formulation of the relevant questions covering the target selected. These rules involve singleness of issue, clarity of issue and literally touch upon the science of semantics.

Adequate formulation of questions for reliable stimulation of the innocent is emphasized, with special consideration of the pending dangers should such questions be of excessive strength, or inadequate strength, or should there be a dangerous overlap into the area embraced by the target issue. (12 hours.)

E. Polygraph examination techniques

This course is devoted to knowing when and how to conduct properly the latest types of polygraph tests. Appropriate emphasis is placed on each specialized criminal and noncriminal polygraph technique. (24 hours.)

F. Polygraph chart interpretation

This course is devoted to the study and practice of intermedite and advance interpretations of the breathing, galvanic skin response, and cardio recordings. (15 hours.)

G. Polygraph interrogation techniques

The entire field of scientific polygraph interrogation is completely covered in great detail. Studied and practiced are the most effective methods and techniques dealing with: the obtaining of case facts from the investigator, suspects, behavior symptoms, the pretest interview, interrogating lying suspects after testing, and how to obtain quickly both typewritten and handwritten confessions. Also taught are the correct handling of witnesses, women, sex offenders, narcotic addicts, and conscience confessors. (15 hours.)

H. Standardized polygraph notepack

This standardized polygraph notepack primarily covers each of the five principal considerations with which an examiner must adequately cope during any "specific incident" polygraph examination. These considerations are as follows: Obtaining and evaluating of case information, selection of proper examination targets, proper formulation of test questions, use of test questions inadequate technique structure, and accurate interpretation of resulting polygraph charts.

The overall approach is based on the premise that each of these principal considerations acts as a link in a chain. Weakness or breakdown in any one of them can be critical to the overall examination result.

One of the most valuable assets resulting from use of this standardized polygraph notepack is the guidance afforded the examiner working in a remote area who has no opportunity to consult with fellow examiners when experiencing technique difficulties which he is unable to isolate. By brief inspection of a less experienced polygraph examiner's notepack, a solution for almost any difficulty can be suggested by specifically pinpointing the initial weaknesses involved. (12 hours.)

I. Polygraph examination observation

This course provides for visits to Mr. Backster's lie detection laboratory at the same address as the school. There the students will observe and wherever possible will help conduct actual polygraph examinations. (12 hours.)

J. Polygraph practice exercises

Practice exercises of 3 hours each are held under realistic examination conditions. The practice exercises are designed to include only what the student has mastered up to that particular exercise. They provide the student with an extremely interesting method of correlating his current knowledge and gaining experience under competent supervision. (33 hours.)

K. Related polygraph instruction

Various topics the qualified examiner must know are discussed many of them never previously taught anywhere, such as: the polygraph examiner's notebook, simplified report writing, public talks, television appearances, press, and intradepartmental relationship. Various other topics are also throughly analyzed. (18 hours.)

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GENERAL INFORMATION

Tuition.—The tuition for this course is $500. The charge for the polygraph examiner's notepack, textbook and all other distributed material and needed stationery supplies is $25. There are no other charges involved. If the student is sponsored by a governmental agency, the agency will be billed. If he is not sponsored, full payment is due at the time of the first class session.

Training schedule.—The length of the polygraph examiner training course is 6 weeks. The class meets Monday through Friday 10 a.m. to 12:50 p.m. and 2 p.m. to 4:50 p.m. The school reserves the right to conduct evening classes when it deems them necessary to maintain a standard of class proficiency. The class starting dates are provided on the attached scheduled of courses. Evening classes will be conducted as the needs presents itself.

Living arrangements.—Most students prefer residing at the Century Hotel which is located on the same block as our classroom facilities—111 West 46th Street. All students are required to live within the city of New York on Monday through Thursday night as certain of these nights will be utilized for additional instructions at no added tuition charge to the student.

Other information.—If you have any questions about the polygraph examiner training course, the school, or desire any other information, write, Frank P. Stone, in care of Cleve Backster, Inc., 165 West 46th Street, New York, N.Y. or telephone Columbus 5–6638.

ENTRANCE REQUIREMENTS

A. Federal or local law enforcement employees

1. A letter from the appropriate official of the law enforcement agency verifying the sponsorship of the applicant.
2. Applicant must possess a high school diploma or an equivalency certificate and provide us with a photocopy of same.

B. All others, including unsponsored law enforcement employees

1. Must have at least 60 credits verified by official college transcripts sent directly to us by each college concerned.
2. Be at least 21 years of age.
3. Successfully meet certain standards as determined from a personal interview evaluation which must be completed no later than during the week preceding the scheduled class applied for.

"POLYGRAPH EXAMINER" TRAINING COURSE

1963 schedule of "polygraph examiner" courses.—October 7, November 15.
1964 schedule of "polygraph examiner" courses.—January 13, February 21, April 6, May 15, June 8, July 17, September 14, and October 23.

EXHIBITS 7A–7E—MATERIAL RELATING TO THE USE BY THE FEDERAL GOVERNMENT OF GALVANOMETERS

EXHIBIT 7A—LETTER FROM LT. GEN. HAROLD W. GRANT, USAF, DEPUTY ADMINISTRATOR, FEDERAL AVIATION AGENCY, TO HON. JOHN E. MOSS, APRIL 9, 1964

FEDERAL AVIATION AGENCY,
Washington, D.C., April 9, 1964.

Hon. JOHN E. MOSS,
Chairman, Subcommittee on Foreign Operations and Government Information, Committee on Government Operations, House of Representatives, Washington, D.C.

DEAR MR. MOSS: This complies with the request of Mr. Samuel J. Archibald, staff administrator of the Foreign Operations and Government Information Subcommittee of the Committee on Government Operations, in his letter of April 2, 1964, that we send to you copies of letters regarding lie detection instruments which may be useful in detecting explosives abroad passenger aircraft.

The enclosed letters are self-explanatory and represent the only letters written by this Agency concerning possible use of polygraph techniques in our efforts to

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solve the airline sabotage problem. Our investigation into the use of this technique indicates that it has no possibilities, in its present state, for use in passenger surveillance, and that future development of such technique is not promising. Therefore, we have no program to experiment with so-called lie detectors on airplane passengers.

Sincerely,

HAROLD W. GRANT,
Lieutenant General, USAF, Deputy Administrator.

EXHIBIT 7B—LETTER FROM FRED B. KEMERY, PROGRAM MANAGER, AIRCRAFT DEVELOPMENT SERVICE, TO J. J. WATSON, APRIL 22, 1963

APRIL 22, 1963.

Mr. J. J. WATSON,
President, C. H. Stolting Co.,
Chicago, Ill.

DEAR MR. WATSON: This is with reference to my telephone call to you in Chicago on April 11, 1963, concerning possible use of polygraph techniques in our program to intercept potential airplane saboteurs.

As I told you, we are exploring various methods of solving this problem and hope to develop a "thicket of obstacles" which will provide a major deterrent to such activities.

I realize that there are legal as well as technical problems involved. I am interested only in the latter at this time. The legalities involved with invasion of private rights will be faced by others if the technical problems are solved.

We are searching for methods which will cause the least obstruction possible to boarding of passengers into air carrier airplanes. I had hoped that the state of the art, with respect to polygraph techniques, may have developed to the point that they might be utilized in this program. I have been thinking in terms of a setup where a passenger would place his hand(s) on electrodes while answering a query as to whether he was carrying explosives aboard the aircraft in his luggage or on his person.

As I indicated to you, I am generally familiar with the capability and use of polygraph equipment. I asked that you give some thought to the possible adaptation of some of the techniques which might aid in solving our problem. I should appreciate hearing from you.

Sincerely,

FRED B. KEMERY,
Program Manager, Equipment Engineering & Safety Program Division, Aircraft Development Service.

EXHIBIT 7C—LETTER FROM FRED B. KEMERY, PROGRAM MANAGER, AIRCRAFT DEVELOPMENT SERVICE, TO R. W. INMAN, APRIL 22, 1963

APRIL 22, 1963.

Mr. R. W. INMAN,
President, Associated Research, Inc.,
Chicago, Ill.

DEAR MR. INMAN: This is with reference to my telephone call to you in Chicago on April 11, 1963, concerning possible use of polygraph techniques in our program to intercept potential airplane saboteurs.

As I told you, we are exploring various methods of solving this problem and hope to develop a "thicket of obstacles" which will provide a major deterrent to such activities.

I realize that there are legal as well as technical problems involved. I am interested in the latter at this time. The legalities involved with invasion of private rights will be faced by others if the technical problems are solved.

We are searching for methods which will cause the least obstruction possible to boarding of passengers into air carrier airplanes. I had hoped that the state of the art, with respect to polygraph techniques, may have developed to the point that they might be utilized in this program. I have been thinking in

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terms of a setup where a passenger would place his hand(s) on electrodes while answering a query as to whether he was carrying explosive aboard the aircraft in his luggage or on his person.

As I indicated to you, I am generally familiar with the capability and use of polygraph equipment. I asked that you give some thought to the possible adaptation of some of the techniques which might aid in solving our problem. I should appreciate hearing from you.

Thank you for your suggestion for possible use of infrared techniques to assist in the solution of our problem. We shall explore this possibility.

Sincerely,

FRED B. KEMERY,
Program Manager, Equipment Engineering & Safety Program Division, Aircraft Development Service.

EXHIBIT 7D—STAFF MEMORANDUM, USE OF LIE DETECTORS IN VIETNAM, APRIL 3, 1964

An Associated Press story, datelined Saigon, February 28, 1964, reported that the United States has used portable polygraphs on the battlefields of South Vietnam, and that the U.S. Army intends to introduce pocket-sized lie detectors into Vietnam, which can be operated by a soldier with a week's instruction.

Subcommittee staff investigation indicates that a spring-and-battery-operated polygraph measuring three responses was used by an Army-trained examiner to check suspected Vietcong agents. While the Army states there is no program underway to develop a pocket-sized lie detection device, a top U.S. provost marshal official in Vietnam did express the belief to reporters that such a machine will work.

He indicated he hoped to field test a single response galvanic reactor. The instrument referred to apparently is a miniature "polygraph" manufactured by Takaikiki Co., Ltd., Japan. The Army contended that no tests of the Japanese instrument have been officially authorized or conducted.

EXHIBIT 7E—LETTER FROM H. B. MONTAGUE, CHIEF INSPECTOR, POST OFFICE DEPARTMENT, TO BENNY KASS, MARCH 24, 1964

POST OFFICE DEPARTMENT,
CHIEF POSTAL INSPECTOR,
Washington, D.C., March 24, 1964.

Mr. BENNY KASS,
House Government Information Subcommittee,
Rayburn Office Building, Washington, D.C.

DEAR MR. KASS: This has reference to your inquiry concerning the use of lie detectors by this service.

In the attachment to our letter of July 26, 1963, to Hon. John E. Moss, it was stated (question 4) that we had 17 machines, but that 13 of them were acquired more than 10 years ago, and employed only a one-phase detection procedure. Of the remaining four, two were three-phase Stoelting polygraphs, and two were modern one-phase B. & W. machines, acquired more recently. This was the status of our lie detection equipment at the close of fiscal year 1963.

In fiscal year 1964 we purchased four Keeler polygraphs, all of them three-phase detection instruments, and have disposed of all one-phase machines. Accordingly, we now have in current use six three-phase polygraphs on a service-wide basis which cost $7,080. The six postal inspectors who operate them received formal training at recognized schools.

Sincerely yours,

H. B. MONTAGUE, *Chief Inspector.*

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EXHIBIT 8—POLYGRAPH LABORATORY AT THE BACKSTER SCHOOL OF LIE DETECTION

The above picture shows a series of panels which contain a variety of objects which are separately illuminated within view of the polygraph subject during a peak-of-tension test. Polygraph laboratory, the Backster School of Lie Detection, New York City.

EXHIBIT 9—LETTER FROM M. W. MYATT, PRESIDENT, ACADEMY FOR SCIENTIFIC INTERROGATION, TO CLEVE BACKSTER, APRIL 6, 1964

APRIL 6, 1964.

CLEVE BACKSTER,
Chairman, Research and Instrument Committee, ASI,
New York, N.Y.

DEAR CLEVE: I failed to receive your letter of March 31 until late April 5. Probably this will not arrive before your departure to Washington.

I am grateful that you will represent the ASI before the congressional committee studying lie detection. I am confident the ASI membership will concur in my sentiments.

You have led the field in research along these lines, by perfection of the standarized note pack. A large number of ASI membership have adopted the idea and I feel more will do so in the future.

You, therefore, have my approval to represent the ASI membership before the congressional committee and explain the needs of the polygraph profession. Please keep me posted as to all events.

Sincerely yours,

M. W. MYATT,
President, Academy for Scientific Interrogation.

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USE OF POLYGRAPHS AS "LIE DETECTORS" BY THE FEDERAL GOVERNMENT

(Part 2—Testimony of Army, Navy, and Air Force Witnesses)

HEARING

BEFORE A

SUBCOMMITTEE OF THE COMMITTEE ON GOVERNMENT OPERATIONS HOUSE OF REPRESENTATIVES

EIGHTY-EIGHTH CONGRESS

SECOND SESSION

APRIL 10, 1964

Printed for the use of the
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USE OF POLYGRAPHS AS "LIE DETECTORS" IN THE FEDERAL GOVERNMENT

(Part 2—Testimony of Army, Navy, and Air Force Witnesses)

FRIDAY, APRIL 10, 1964

HOUSE OF REPRESENTATIVES,
FOREIGN OPERATIONS AND
GOVERNMENT INFORMATION SUBCOMMITTEE
OF THE COMMITTEE ON GOVERNMENT OPERATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., pursuant to recess, in room 1501–B, Longworth Office Building, Hon. John E. Moss (chairman of the subcommittee) presiding.

Present: Representatives John E. Moss and Henry S. Reuss.

Staff members present: Samuel I. Archibald, staff administrator; Jack Matteson, chief investigator; and Benny L. Kass, counsel.

Mr. Moss. The subcommittee will be in order.

Our witnesses this morning are Maj. Gen. Ralph Joseph Butchers, Provost Marshal General, Department of the Army; Col. Robert E. Sullivan, Commandant, U.S. Army Military Police School; Lt. Col. Nicholas D. Rudziak, Chief, Military Police Branch, Protective Services Division of the Provost Marshal General's Office, Department of the Army; CWO Thomas Raymond Beck, Chief, Polygraph Committee, Department of Specialized Instruction, Fort Gordon, Ga.

Those are the gentlemen who are here with us this morning.

Gentlemen, I wonder if you would stand and be sworn.

Do you each and each of you solemnly swear the testimony you are about to give this subcommittee shall be the truth, the whole truth, and nothing but the truth, so help you God?

TESTIMONY OF MAJ. GEN. RALPH JOSEPH BUTCHERS, PROVOST MARSHAL GENERAL, DEPARTMENT OF THE ARMY; ACCOMPANIED BY COL. ROBERT E. SULLIVAN, COMMANDANT, U.S. ARMY MILITARY POLICE SCHOOL; LT. COL. NICHOLAS D. RUDZIAK, CHIEF, MILITARY POLICE BRANCH, PROTECTIVE SERVICES DIVISION, PROVOST MARSHAL GENERAL'S OFFICE, DEPARTMENT OF THE ARMY; AND CWO THOMAS RAYMOND BECK, CHIEF, POLYGRAPH COMMITTEE, DEPARTMENT OF SPECIALIZED INSTRUCTION, FORT GORDON, GA.

General BUTCHERS. I do.
Colonel SULLIVAN. I do.
Colonel RUDZIAK. I do.
Mr. BECK. I do.

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Mr. Moss. Will you identify yourself for the record.
General BUTCHERS. Maj. Gen. Ralph Joseph Butchers.
Colonel RUDZIAK. Lt. Col. Nicholas D. Rudziak.
Colonel SULLIVAN. Col. Robert E. Sullivan.
Mr. BECK. CWO Thomas Raymond Beck, Polygraph Committee, Fort Gordon, Ga.
Mr. Moss. General, do you have a statement?
General BUTCHERS. I have a statement, sir.
Mr. Moss. You may proceed.
General BUTCHERS. Mr. Chairman and members of the committee, I am Maj. Gen. Ralph J. Butchers, the Provost Marshal General, Department of the Army. I am here at your invitation to discuss the policy and procedures of the military police regarding the employment of the polygraph.

As the Provost Marshal General, I have Army staff responsibility for the broad functions of protective services, preservation of law and order, and crime prevention in the Army. I can be considered, in a sense, as the "chief of police" of the Army. The operations of the military police, the law enforcement element of the Army, fall under my responsibility as provost marshal general.

The military police investigate alleged offenses which are within the jurisdiction of courts martial and which are committed against the provisions of the Uniform Code of Military Justice, against the law of war, or against the law of a territory occupied as an incident of war.

The military police perform these investigations to determine and to report the facts of a case to the appropriate commander to aid him in maintaining discipline, law, and order within his command. The military police cooperate fully with Federal, State, and municipal law enforcement agencies when a mutual interest in a case exists.

We perform our criminal investigation and law enforcement work in order to safeguard the rights of the individual and society as well as from invasion by the lawless. At the same time in the course of our investigative and law enforcement activities we are ever mindful of the rights of those suspected of crime.

The phenomenal advancement of scientific crime detection in recent years makes police science an indispensable factor in the fight against crime. The polygraph technique for detecting deception has been demonstrated to be a valuable aid to investigation.

The military police recognize the value of the polygraph technique, properly administered, as an investigative aid both in identifying those implicated in a crime and also in exonerating innocent persons upon whom other evidence had cast a shadow of suspicion.

But we recognize as well the right of the individual to privacy and the security of person and we realize that improper application of polygraph techniques can invade those rights. Accordingly, our operating policies and procedures carefully circumscribe the use of the polygraph and set high standards for the caliber and training of our polygraph operators.

Army regulations governing employment of the polygraph are extensive, detailed, and designed to safeguard the security of the person and his right of privacy as well as to insure accurate interpretation of the results of the polygraph examination.

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Under the Army regulations, all polygraph examinations are voluntary. No one can be required to submit to a polygraph examination without his consent. An individual cannot be told that refusal to submit to an examination will be construed as a tacit admission of guilt and no such inference can be drawn from a person's refusal to be examined.

Every person to be examined must read and sign a witnessed statement which enumerates his absolute right to remain silent, his absolute right to refuse any polygraph test at all, and that any statement he makes may be used as evidence against him in a trial.

Army regulations forbid the administration of a polygraph examination by anyone other than qualified, accredited polygraph examiners and until sufficient facts of the case have been established to enable the operator to construct adequate, objective, and comprehensive questions.

Investigators are admonished not to subject a person to prolonged interrogation just prior to a polygraph examination. A polygraph examination may not be given to anyone who is apparently mentally or physically fatigued, emotionally upset, intoxicated, under the influence of a sedative, or known to have a mental disorder or drug addiction.

No person can be examined by polygraph while experiencing physical discomfort of such magnitude or possessing such physical disabilities as might cause an abnormal response to be recorded.

An examiner must confine his test questions to matters that are pertinent to the offense under investigation and may not ask unnecessary or unrelated questions. For example, questions concerning sex, religion, or politics, if not directly related to the investigation at hand, are prohibited.

We neither tolerate nor condone "fishing expeditions" on the part of our polygraph examiners. An explanation of the nature of the examination must be given to the person to be examined prior to the beginning of the examination. All questions to be asked during a test must be reviewed in detail with the person to be examined before the test begins.

The polygraph charts produced in a polygraph examination are interpreted by the examiner himself, retained in the local investigative files in locked containers, and destroyed after 1 year. They are not made part of the criminal investigative report on the case in question.

The examiner is required in each case to prepare a "Polygraph Examiner's Data and Question Sheet"—I have copies with me here, sir—which reflects the scope of the examination he conducted. This document is attached to and becomes a part of the pertinent criminal investigation report on the case.

In addition, the examiner is required to complete the polygraph examination report showing the results of his investigation. This too, is attached as an exhibit to the pertinent report of investigation.

The results of polygraph examinations are inadmissible in courts-martial and in administrative board proceedings.

Only persons specially authorized to view reports of investigation have access to those reports, whether or not they contain polygraph results. Such persons include the investigators of the particular case, the provost marshal and the local Army commander.

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I have described briefly how the concern of the Army and its military police for the personal and legal rights of those suspected of crime is implemented by the Army regulations controlling the administration of polygraph examinations by the military police.

I now turn to a matter of equal importance, the training and qualifications of polygraph examiners. The military police do not consider the polygraph to be foolproof or infallible. The polygraph has proved to be an effective investigative aid in determining truth or deception on the part of persons involved in a criminal investigation.

However, the polygraph is not and cannot be used as a substitute for other criminal investigative techniques. In fact, a thorough investigation of the facts of a case must precede the administration of a polygraph examination, if the examination is to be effective.

Moreover, the accuracy and validity of polygraph examinations are directly related to the competence and integrity of the examiners. I believe the polygraph examiners found in the Military Police Corps amply possess the integrity, background, training, and experience necessary for the technique of polygraph examination.

Only qualified accredited warrant officer criminal investigators can volunteer and be considered for training in the Military Police Corps as polygraph examiners. An accredited warrant officer criminal investigator—and I speak now of the applicant for warrant officer, criminal investigator, not the polygraph examiner—must possess the following qualifications:

He must be a U.S. citizen; have no history of mental disorders; possess suitable character, loyalty, and integrity as established by character and security investigation; he must have no criminal convictions; he must be at least 22 years old; he must be physically fit; have a minimum of 2 years of military service, and 2 years of college training at an accredited institution or the equivalent thereof.

Finally, he must successfully complete the criminal investigation course at the U.S. Army Military Police School, located at Fort Gordon, Ga.

Even if a member of the Military Police Corps meets all these requirements of the qualified accredited warrant officer criminal investigator, he must be at least 25 years old and possess at least 1 year's experience as a criminal investigator in the field before he can apply to be trained as a polygraph examiner.

Knowing of the committee's interest in experience, I had a random sample taken of the average age of our polygraph examiners attending school for the last 10 years. This random sample showed that no man had taken the course there under 27 years of age, that the average age of those attending was 35, and that those attending the reorientation course was 43. The oldest man was 46. Average investigative experience is a minimum of 5 years.

Then, if his application is approved by his immediate commander and is accepted by the Military Police School, the polygraph examiner candidate returns to the Military Police School at Fort Gordon for an intensive course of instruction in polygraph examination which Colonel Sullivan, commandant of the school, will describe in his statement for you today. If the candidate successfully completes his polygraph training, he returns to his primary duties as a criminal investigator.

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As provost marshal general, I take pride in the professional and dedicated attitude of the members of the military police in carrying out the law enforcement mission assigned to them in the Army. I take great pride as well in our school and training program within the corps which prepare the military police for their duties in preserving and promoting the rule of law and order and respect for individual rights. Our standards in the military police are high. We constantly strive to uphold them.

Mr. Chairman, this concludes my statement.

I would like Colonel Sullivan now to discuss the training conducted at Fort Gordon.

Mr. Moss. Certainly, Colonel. You are recognized for that purpose.

Colonel SULLIVAN. Mr. Chairman and members of the committee, I am Col. Robert E. Sullivan, commandant at the U.S. Army Military Police School at Fort Gordon, Ga. I am here at your invitation to discuss the course of instruction in polygraph examinations which we teach at the Military Police School.

The Military Police School is under the supervision of the commanding general, U.S. Continental Army Command. During its 21 years of operation, the Military Police School has trained approximately 100,000 persons from the Armed Forces and from other Government agencies in a variety of subjects related to law, order, and crime prevention.

In 1951 a course in polygraph instruction was established at the Military Police School to meet the need for trained polygraph examiners in the military services and to insure the standardization of polygraph techniques and procedures within the Army. Since then all military police polygraph examiners have been trained in this course.

The course of instruction in polygraph examination is 7 weeks long and consists of 258 hours of academic subjects, practical exercises and examinations. After 3 hours of orientation the student receives 5 hours of instruction by an attorney on the legal aspects of polygraph examination. This instruction emphasizes the constitutional rights of the individual, particularly the right against self-incrimination and the law of confessions and admissions.

The course includes 20 hours of instruction and practical exercises in the mechanics of the polygraph instrument. The student is taught to recognize malfunctions in the instrument and to make the on-the-spot minor adjustments, if necessary, to put the instrument in proper working order.

The course also includes 10 hours of instruction in physiology, concentrating on the nervous system, the cardiovascular system and the respiratory system and their relation to the polygraph technique. Nine additional hours of instruction on psychology include 2 hours in the methods used in Backster zone comparison technique of polygraph testing and 7 hours on abnormal psychology.

One of the most important phases of the course consists of 37 hours of instruction and practical exercise on the technique for detecting deception in polygraph examinations. This block of instruction includes 16 hours on the methods of polygraph pretest interviewing, 1 hour on polygraph chart markings, and 10 hours of instruction and practical exercises on test construction which emphasize the rules and

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mechanics of the latest techniques. This 37-hour block concludes with 10 hours instruction and practical exercises on the interpretation of actual polygraph charts.

The final phase of the polygraph course includes 166 hours and consists almost entirely of training students under close supervision in the conduct of polygraph examinations of live subjects and hypothetical criminal cases and occasionally in actual minor cases occuring at Fort Gordon. Students are critiqued after all practical exercises.

During the polygraph course students are continually evaluated and graded by their instructors on the basis of their classroom performance. In addition, four written examinations are administered and each is followed by a 1-hour critique of the test results. During the entire polygraph course instructors are assigned as faculty advisers to the students.

Each faculty adviser is responsible for evaluating the personal characteristics of the two to four students assigned to him. He also advises them concerning any course problems that they may have and guides them and reports on their individual progress. Each student is observed throughout the course for any sign of qualities which could disqualify him as a competent polygraph examiner.

If a student fails to meet the personal performance or academic standards of the polygraph course, he is eliminated from it. The overall attrition rate for the last 5 years has been 5.4 percent. Last year's rate was 8.3 percent. In addition to this basic 7-week polygraph course, the Military Police School also conducts a 2-week course to provide the latest developments in polygraph techniques to polygraph examiners previously graduated from the school's basic course.

This refresher course includes 70 hours of instruction, practical exercises and written examinations. Since the introduction of this course in December 1962, 2 classes have been conducted and 29 examiners graduated.

Mr. Chairman, this concludes my statement.

Mr. Moss. Thank you.

General BUTCHERS. That concludes the prepared statements, Mr. Chairman.

Mr. Moss. Thank you.

Mr. Kass?

Mr. KASS. General Butchers, what use does the Army Provost Marshal make of the polygraph?

General BUTCHERS. We confine our examinations entirely to criminal-type cases. No preemployment, no screening. Uses of that nature.

Mr. KASS. Just in the criminal situation?

General BUTCHERS. Criminal investigation, that is correct.

Mr. REUSS. At that point, Mr. Chairman, may I ask a question?

Mr. Moss. Certainly, Mr. Reuss.

Mr. REUSS. According to the agency reply furnished this subcommittee by the Department of the Army, the military police, your organization, General Butchers, were responsible for 4,400 tests performed during fiscal 1963. Those were all in connection with a criminal accusation, were they not?

General BUTCHERS. That is approximate, sir. These figures were furnished in the summer, I believe, in June.

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Mr. REUSS. I should add that the report says approximate, and I don't mean to pin you down.

General BUTCHERS. That is correct.

Mr. REUSS. My point is those were all criminal investigations.

General BUTCHERS. That is correct, sir.

Mr. REUSS. In addition to that, the Army last year, through Army Intelligence, covered 8,094 polygraph tests for security and personnel screening purposes, is that not true?

General BUTCHERS. I have no knowledge of that, sir, other than what I see in this report.

Mr. REUSS. So you are able to report to us only on the criminal investigative nature of Army use of polygraphs and there may be other uses of the polygraphs in the Army which result in far greater numbers of polygraph tests, is that not so?

General BUTCHERS. That is correct.

Mr. KASS. General Butchers, your Provost Marshal's office conducts the only polygraph school within the Army Department, is that correct?

General BUTCHERS. That is correct.

Mr. KASS. Is the polygraph school at Fort Gordon, Ga.?

General BUTCHERS. That is correct.

Mr. KASS. Is this polygraph school at Fort Gordon, Ga., the only polygraph school in the Federal Government?

General BUTCHERS. To my knowledge, it is.

Mr. BECK. I know of no other; sir.

Colonel SULLIVAN. As far as we know, sir.

Mr. KASS. By school, we are talking about a formal school and not informal training courses such as the Office of Naval Intelligence would have. We are talking about a formal school and to your knowledge this is the only formal school within the Federal Government.

General BUTCHERS. That is correct, sir.

Mr. KASS. Could you briefly for the record describe your training course, or perhaps Colonel Sullivan may define that.

General BUTCHERS. May I defer to Colonel Sullivan on that?

Colonel SULLIVAN. You mean something in addition to the outline of the course in my statement?

Mr. KASS. Yes, sir; the content of your training course. Let us be specific. You discussed the latest training methods which have been developed. Could you address your answer to that point?

Colonel SULLIVAN. On that I would defer to Mr. Beck, our chief instructor.

Mr. BECK. The latest training methods we use now are Backster's methods and Reid's methods. We have a combined course. These are the two we feel are the best.

Mr. KASS. Could you define for the record what Backster's and Reid's method is.

Mr. BECK. Reid's method is the controlled question method as he calls it, and Backster's method is spot analysis.

Mr. KASS. By Reid——

Mr. BECK. John Reid who was here.

Mr. KASS. The witness who testified yesterday?

Mr. BECK. Yes, sir.

Mr. KASS. The witness Cleve Backster of New York City, who also testified before us?

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Mr. BECK. Yes.
Mr. KASS. Do you use both courses as a training method?
Mr. BECK. Yes.
Mr. KASS. Both the Reid and the Backster?
Mr. BECK. Yes, sir.
Mr. KASS. Is there a basic difference between them?
Mr. BECK. This is so, as I believe Mr. Backster stated yesterday. His method is an extension of the Reid method and in this light we instruct in both.
Mr. KASS. Mr. Beck, in your program of instruction for the polygraph course——
Mr. BECK. Yes, sir.
Mr. KASS. Approved by, apparently, the Department of the Army or CONARC, December 6, 1963, you summarize your polygraph course, the academic subjects having a total of 258 hours.
Mr. BECK. On what page?
Mr. KASS. That is on page 2.
Mr. BECK. Yes, sir.
Mr. KASS. On page 4 included among the academic subjects you talk, near the bottom, of the technique for conducting polygraph examinations and it says conduct of the Backster zone comparison test (33–33), whatever that means. Where is the Reid control test?
Mr. BECK. Thank you, sir. We first give them the basic Backster technique. After they have worked on this for several days, drop on down there where it says polygraph test phase 1, 33–33, in there it doesn't so state, but we pick up and discuss the Reid and the work on that.
The reason we find Mr. Backster's name in our program of instruction is when he gave us the legal authority to use his material, he requested that we also use his name.
Mr. KASS. By legal authority, was it through a contract?
Mr. BECK. We have written authority from Mr. Cleve Backster in letter form by our legal office, signed by Mr. Backster and his former partner authorizing us to use his technique.
Mr. KASS. Was this through an Army contract?
Mr. BECK. No, sir.
Mr. KASS. Or was this merely through Mr. Backster turning it over?
General BUTCHERS. Through release of his material.
Mr. KASS. In your U.S. Army Military Police School, Department of Specialized Instructions, could you identify what these are, for the record?
Mr. BECK. Give me the code number.
Mr. KASS. DS1428LU. What is this whole packet of material? There are about 15 annexes.
Mr. BECK. Lesson plans.
Mr. KASS. This is in effect what you teach your students at the Fort Gordon School?
Mr. BECK. Yes, sir.
Mr. KASS. In this Fort Gordon School, Annex No. 7, for the record, DS1433L, unclassified, it says the conduct of "Backster zone of comparison test." Then you go on, on page 2 in the very opening comment:

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You have now learned the principles of the Backster "zone of comparison test." In order to be proficient in this technique you must practice. Make the most of this time.

This Backster test is the one we had defined to us yesterday through Mr. Backster's demonstration and discussion with the subcommittee.

Mr. BECK. He described portions of his test, not the entire test.

Mr. KASS. But portions of it is what you also teach at the Fort Gordon School.

Mr. BECK. We teach the entire text.

Mr. KASS. I see. Colonel Sullivan, on page 2 of your statement you refer to the training course which includes—

nine additional hours of instruction on psychology including 2 hours on methods used in the Backster zone comparison technique of polygraph testing and 7 hours of abnormal psychology.

Who teaches that section of the course?

Colonel SULLIVAN. Members of our own faculty on the polygraph committee.

Mr. KASS. Are they psychologists?

Colonel SULLIVAN. They are not.

Mr. KASS. Are they doctors?

Colonel SULLIVAN. They are not.

Mr. KASS. Are they psychiatrists?

Colonel SULLIVAN. They are not.

Mr. KASS. In the legal section who teaches the legal aspects of the training course?

Colonel SULLIVAN. A Colonel Flynn who is a JAG officer, a graduate lawyer, and a member of our faculty.

Mr. KASS. Why do you make the distinction of a lawyer teaching the legal aspects and a nonprofessional in the psychology aspects?

Colonel SULLIVAN. Availability. We have a qualified lawyer on our staff for our other legal instructions and we take advantage of him in giving the instructions on the polygraph.

Mr. KASS. There are no qualified doctors or psychiatrists in the Fort Gordon area?

Colonel SULLIVAN. Yes, sir.

Mr. KASS. You said availability. I didn't quite understand what you meant by that.

Colonel SULLIVAN. He was a member of our faculty, actually, assigned to our school.

Mr. KASS. In other words, you could not get a member of the psychiatry field or the medical field assigned to your school?

Colonel SULLIVAN. I am reasonably sure we could. Actually, however, the legal instruction we feel is not necessarily required to be given by a lawyer because the extent of the instruction is not a very deep involvement. It is merely a recanting of that which has been stated, and we feel this way about the other fields.

Mr. KASS. You feel in the medical field and psychiatry field in the 7 hours, I believe you stated, of abnormal psychology a layman can adequately get this through to the students?

Colonel SULLIVAN. Yes, sir; I feel so, to the extent that we get into it, yes.

Mr. KASS. You have stated in your statement that you teach live subjects and hypothetical criminal cases and occasionally you said you

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also will use minor real live situations. Could you elaborate this a little bit for the record.

Colonel SULLIVAN. Yes, sir. Of course, the live cases are as they become available. If there are no currently being investigated cases on the post that would lend themselves to use by our school, then we don't have the advantage of using them. If they are available, if there are live cases going on at the time that would adapt themselves to our use, this is what we refer to.

Mr. KASS. Do you have an estimate of the number of live cases that the student will receive during the course of a training program?

Colonel SULLIVAN. This I would refer to Mr. Beck.

Mr. BECK. Sir, this is a variable factor again, as Colonel Sullivan stated, depending on the availability of cases. We just can't go out and invent actual cases. It depends on the crime rate as it occurs on the post.

Mr. KASS. Could you find out for the record, or do you have the information available now, in the course of a year how many real live cases are given to the trainees?

Mr. BECK. Would you be susceptible to a "guesstimate"? We will have to get it for you, sir. We only have it for 1 year because our records are held for a current year and then destroyed. I can give it to you for 1963, I believe.

Mr. KASS. Mr. Chairman, could we hold the record at this point for those?

Mr. MOSS. Yes; the record will be held at this point to receive that information.

(The information to be furnished follows:)

Available records show that during 1963, students undergoing polygraph training at the Military Police School tested 188 live subjects involved either directly or indirectly in criminal investigations of offenses committed at Fort Gordon, Ga. All live subjects were volunteers who agreed to be examined by the students at the Military Police School in meeting training objectives. The number examined under these training conditions is unique and bear no relationship or comparison to any other polygraph examination situation at any other Army installation or military unit.

During 1963, four polygraph classes were conducted. A total of 72 students completed the course. Each student participated in approximately 20 practice sessions per course, which represented 202 hours of practice runs per student on the polygraph prior to graduation. These practice runs were in addition to the live subject examinations listed above.

Mr. KASS. What does a student receive when he leaves your training course? Does he receive a citation, a certificate?

Colonel SULLIVAN. A diploma actually.

Mr. KASS. What does this diploma state?

Colonel SULLIVAN. Merely that he has graduated from this specific course.

Mr. KASS. What does this entitle him to?

Colonel SULLIVAN. To our military police, CID, investigators, this entitles him to then be able to quote a requirement for acquring a MOS—military occupational specialty number—identifying him as a polygraph examiner. This is a prerequisite.

Mr. KASS. There is an MOS for polygraph examiner?

Colonel SULLIVAN. Yes; there is.

Mr. KASS. Does a polygraph trainee who leaves your school and receives your certification become a qualified polygraph examiner?

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Colonel SULLIVAN. When he leaves the school and receives the MOS, he is then identified as a polygraph examiner. An additional skill incidentally to an investigator. He also is still an investigator.

Mr. KASS. I understand. Therefore, it is also possible that the man with the MOS as a polygraph examiner can start running polygraph examinations in the field on his own.

Colonel SULLIVAN. That is correct.

Mr. KASS. It is also possible as I understood from the record earlier that this man who can run polygraph examinations on his own has perhaps not received any actual cases in training, is that correct?

Colonel SULLIVAN. I would refer that to Mr. Beck. You mean live cases, not hypothetical?

Mr. KASS. Real live cases.

Mr. BECK. During school?

Mr. KASS. During school.

Mr. BECK. Yes; this is possible if they are not available. It is possible.

Mr. KASS. Do you think this is adequate training for an individual who leaves a polygraph school and who can conduct polygraph examinations on his own who has not had any real live cases for training?

Mr. BECK. I would like to pass to General Butchers.

General BUTCHER. If I can take that, it gets a little beyond the training field, if I may. We try to assign these polygraph operators to what we call the larger units where they can work with experienced examiners. In any case we have very strict controls of supervision over these examiners when they arrive at their new station.

Specifically, it is possible that this man has never had a live case. We have every confidence in the man to conduct live cases, but for a period of several months we like to have him work under supervision of an experienced examiner and certainly in all cases, whether an experienced examiner is there or not, working under an experienced provost marshal, a commissioned officer and a commander of a CID unit and experienced warrant officer.

Mr. KASS. You say you would like. Do your regulations state this requirement?

General BUTCHERS. No; they do not. By assignment we try to do this. We have troops all over the world and it is not always possible.

Mr. KASS. Therefore, it is possible in a criminal situation that a polygraph examiner with an MOS of polygraph specialist can perform a test out in the field without having had any real live situations.

General BUTCHERS. Let me emphasize under exacting supervision.

Mr. KASS. Could you answer the question first, please?

General BUTCHERS. Yes; that is correct. If I may add under exacting supervision. If the supervisor does not have the confidence in the man in reviewing the questions that the man built up, an experienced examiner is no further away than the nearest telephone.

We have portable instruments and a man can and is brought in, or the subject taken out to the examiner.

Mr. KASS. In this field situation who makes the decision to use the polygraph?

General BUTCHERS. There is one of two people. Either the provost marshal or the Chief of the CID in charge of the investigation.

Mr. KASS. You are the provost marshal, general?

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General BUTCHERS. Yes; but I refer to the local provost marshal. We are completely decentralized. It is the local provost marshal.

Mr. KASS. Is this a power delegated by yourself?

General BUTCHERS. Negative. It is the power of the local commander, the installation commander, who passes it to the provost marshal.

Mr. KASS. It is a power which is delegated to the local provost marshal by his local commander?

General BUTCHERS. I don't know that I have ever seen any formal delegation of that. It is the duty of the provost marshal.

Mr. KASS. May the provost marshal further delegate this power to give a polygraph exam to the individual polygraph examiner?

General BUTCHERS. Yes.

Mr. KASS. In some situations the polygraph examiner without the approval of the provost marshal, his commander, or your office here in Washington, can run a polygraph examination in the field?

General BUTCHERS. The answer is "Yes." You can have a very small detachment, that consists of one investigator. In this instance it would be delegated to this examiner.

Mr. KASS. When did the Army provost marshal last make a survey to determine the number of polygraph tests which were given by investigators who have never given a real live test in training prior to that?

General BUTCHERS. That survey to my knowledge has never been made. This has just come up during this investigation.

Mr. KASS. General, do you think that would be a good survey for the Department of the Army to enter into?

Colonel SULLIVAN. I don't think it would be very significant from a practical point of view.

Mr. KASS. Colonel, from a practical point of view you feel there is nothing wrong with letting a man who has had no real live training situations give a polygraph exam in the field?

Colonel SULLIVAN. That is correct. I think it must be viewed in the context of how we use the instrument, who the people are who are first of all selected to take this training, and then secondly what becomes of it.

Mr. KASS. Could we start with the first part of your question. Who are these people who are qualified?

Colonel SULLIVAN. First of all they are experienced investigators.

Mr. KASS. What is their minimum qualifications for experience?

Colonel SULLIVAN. It has been read here earlier. I will refer back to General Butchers' statement.

Mr. KASS. One year of training experience.

Colonel SULLIVAN. One year of investigative experience. This is minimum we are talking about.

Mr. KASS. Let us stay with the minimums because practically speaking the man could become a polygraph examiner and give a polygraph exam with just 1 year of investigative experience.

Colonel SULLIVAN. That is correct.

Mr. KASS. Will you continue with the qualifications, please?

General BUTCHERS. For the record you better go to page 5 and take all of the basic qualifications.

Colonel SULLIVAN. We are talking about the investigator now.

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General BUTCHERS. Shall we quote from the regulations?

Mr. KASS. Yes, please. Could you identify for the record the regulations.

Colonel SULLIVAN. This is Army Regulation 195–11, paragraph 4. The prerequisites for acceptance, referring now to the investigative field, Military Police Criminal Investigation Division. I will skip the first part of the paragraph and go right down to subparagraph (a).

First, U.S. citizenship. Second, no history of mental disorder, including pathological personality disorders described in paragraph 6 of SR 40–1025–2.

Mr. KASS. Colonel, could I interrupt for a minute? Are these the qualifications for an investigator within the military police criminal investigators, or is this the qualifications for a polygraph examiner within the military police?

Colonel SULLIVAN. They are both identical because he must first be an accredited criminal investigator before he can be eligible to take the training for polygraph examiner. So we are dealing with an already carefully selected group. This is one point I wish to make.

Mr. KASS. Could you skip to point (f) minimum age, 22 years.

Colonel SULLIVAN. This is for an investigator; yes, sir.

Mr. KASS. It is not for a polygraph examiner from your statement.

Colonel SULLIVAN. That is correct. There are additional qualifications required over and above those for investigator, which are also required now for polygraph training.

Mr. KASS. I understand. Mr. Moss, could we insert the pertinent parts of Army Regulation 195–11?

Mr. MOSS. Without objection it will be inserted in the record. (See exhibit 13, p. 278.)

Mr. KASS. General Butchers, is the individual who is asked to take a polygraph exam, or to rephrase that, is the polygraph exam always given on a voluntary basis?

General BUTCHERS. Yes.

Mr. KASS. In other words, he doesn't have to take a polygraph exam if he doesn't want to.

General BUTCHERS. He doesn't have to take the polygraph exam unless he wants to.

Mr. KASS. What happens if the individual refuses to take a polygraph exam?

General BUTCHERS. Other investigative leads are explored. There is no stigma attached to refusal. There is no inference of admission of guilt or of innocence, if it works the other way. There is nothing at all.

Mr. KASS. Is there any indication of the individual's refusal to take the polygraph exam made in his personnel folder?

General BUTCHERS. Negative.

Mr. KASS. Is there any indication that the person refused to take the polygraph exam referenced in the investigative folder?

General BUTCHERS. Affirmative.

Mr. KASS. If there is no stigma attached, why do you put it in his investigative folder?

General BUTCHERS. No. 1, it completes the investigation, and also it gives the investigators a lead as to where they might very well bend their efforts in seeking evidence through other techniques.

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Mr. KASS. In other words, if the individual reviewing the investigative folder sees that the man has refused to take a polygraph exam then he will bend his efforts——

General BUTCHERS. It could assist that way.

Mr. KASS. To what?

General BUTCHERS. To use other investigative techniques to determine this man's guilt or innocence, to determine whether there is evidence or not.

Mr. KASS. Colonel Sullivan, you are shaking your head.

Colonel SULLIVAN. I am sorry, that was an involuntary shake of the head. I think it was inadvertent that the general said "guilt or innocence." This is the job of the court and not the investigator.

General BUTCHERS. I accept that.

Mr. KASS. Could the Criminal Investigative Division of the Department of the Army rely then on their investigation without the polygraph exam?

General BUTCHERS. Yes.

Mr. KASS. Why do you use the polygraph exam?

General BUTCHERS. It saves time and effort. It saves money and investigative time. Colonel Sullivan comments that it opens other areas that we might not otherwise find lucrative for investigation.

Mr. KASS. By "lucrative," could you explain that? In other words, other areas not related to the case at hand?

General BUTCHERS. No; not at all. The questions and answers are solely related to the case at hand.

Mr. KASS. General, what does——

General BUTCHERS. But areas within this case is what he is talking about.

Mr. KASS. General, what does the polygraph examiner do with information which he gains from the course of a polygraph examination? I mean by this, not only the test itself when the man is strapped to the instrument, but also the pretest interview and the post, if there is any interview. What does the investigator do with this information which he may gain, which although not pertinent to the case at hand does come out in the course of investigation?

General BUTCHERS. May I turn this to Colonel Rudziak.

Colonel RUDZIAK. If information is developed during the course of an investigation which is not pertinent to that investigation but is of a criminal nature, this is then taken up and exploited to determine the extent, the scope, and the details concerning the side issue that were developed as a result.

We do not disregard criminal information which is developed during the course of an investigation.

Mr. KASS. Are all the answers which the individual subject makes to the polygraph examiner recorded?

Colonel RUDZIAK. Yes, sir.

Mr. KASS. What is done with that information?

Colonel RUDZIAK. That becomes a part of the examiner's report which is retained with the chart in the field office under controlled conditions and it is destroyed after 1 year.

Mr. KASS. So then this information, although passed on to the investigative folder, is destroyed after 1 year with nothing being done with it?

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Colonel RUDZIAK. As it pertains to this case, negative. That part dealing with another incident, another event, another criminal act, is passed on and becomes another case.

Mr. KASS. Passed on?

Colonel RUDZIAK. To the criminal investigation detachment or to the commander.

Mr. KASS. If this other information were of a criminal nature which would not be within the jurisdiction of the military, what would be done with that information?

Colonel RUDZIAK. If it is not within the jurisdiction of the military we would turn it over to the proper jurisdiction. It could conceivably be the FBI in cases of crimes involving Federal jurisdiction or it could be of a civil nature and be turned over to civil authorities.

Mr. KASS. Colonel Rudziak, could you describe the polygraph interrogation room?

Colonel RUDZIAK. I would defer that to Mr. Beck who is the expert.

Mr. BECK. The polygraph interrogation room is a room which is normally not smaller than 9 feet square. It contains a desk, two chairs, one for the examiner, one for the subject, and if an interpreter is present, three chairs, one for him also. In the desk is mounted in the case of most military, a portable instrument of various manufacturers. It also contains a two-way mirror observation and sound recording equipment for listening.

Mr. KASS. Is there a two-way mirror?

Mr. BECK. Yes.

Mr. KASS. Are there concealed microphones?

Mr. BECK. Some are concealed, some are not. It just depends on the installation. We have both.

Mr. REUSS. Mr. Chairman, at this point I would like to ask this question. Is the person who is subject to the polygraph examination warned in advance of the fact that there is a two-way mirror and a possibly concealed observer of him, and is he warned of the fact that there is a concealed microphone and is he warned of the fact that his remarks are being recorded?

Mr. BECK. There is no specific requirement for this that I know of in any regulation so it is not done; no, sir.

Mr. REUSS. There is nothing in Field Manual 19–20 which requires or even suggests to the polygraph operator that this warning of the concealed two-way mirror, the concealed microphone and the unreported recording be disclosed to the subject?

Mr. BECK. I am not familiar with that.

Colonel RUDZIAK. Mr. Chairman, may I respond to that. I would like to read for the record, if I may, article 31 of the Manual for Courts Martial, 1951. I think it is pertinent here to the question being raised.

Mr. REUSS. Before you read it, is there anything in Field Manual 19–20, which bears on the subject of disclosure to the polygraph subject of the information that I am describing?

Colonel RUDZIAK. Yes, sir. The Field Manual refers somewhere to the fact that the subject will be advised of his rights under article 31 of the Manual for Courts Martial.

Mr. REUSS. What article of the FM–19–20 is that?

Colonel RUDZIAK. I would have to check that.

Mr. REUSS. Check that and furnish it for the record.

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Colonel RUDZIAK. For the record: Paragraph 42, FM–19–20; military police investigations, article 31, Manual for Courts Martial, 1951, is entitled, Compulsory Self Incrimination Prohibited. Paragraph (a):

No person subject to this code shall compel any person to incriminate himself or to answer any question the answer to which may tend to incriminate him.

(b) No person subject to this code shall interrogate or request any statement from an accused or a person suspected of an offense without first informing him of the nature of the accusation and advising him that he does not have to make any statement regarding the offense of which he is accused or suspected, and that any statement made by him may be used as evidence against him in a trial by court-martial.

(c) No person subject to this code shall compel any person to make a statement or produce evidence before any military tribunal if the statement or evidence is not material to the issue and may tend to degrade him.

(d) No statement obtained from any person in violation of this article, or through the use of coercion, unlawful influence, or unlawful inducement shall be received in evidence against him in a trial by court-martial.

Mr. REUSS. If that is all that is involved there you need read no further because your regulations require the usual mumbo jumbo about anything you say may be used against you. But my question, sir, was directed to whether the U.S. Army, an organization the good faith of which we all have an interest, warns the subjects who are brought in and to whom the mumbo jumbo about whatever you say may be held against you, of the fact that big brother may be looking at him behind the two-way mirror, that there is a concealed mike. Address yourself to that.

If not, when will steps be taken—and I hope before the day is out—to see that the manual is amended so that this, I think, indefensible procedure, is stopped, and the people are warned of what goes on behind the mirror, and under the desk.

General BUTCHERS. I have taken the consensus here, Mr. Congressman. No one here knows whether or not the man is warned of the existence of the two-way mirror and of the recording device.

Mr. REUSS. Since it is not in the regulation or at least you can't point out to me any place in the regulation where the operator is required to give such warning, and since your regulations fairly bristle with other instructions to the operator, I would think that an operator reading that would think that his duty is done when he does the 87 things that you require him to do, wouldn't you, as a reasonable man?

General BUTCHERS. I will have to agree with you there. We are talking about criminals. There are people suspected of crime. We are talking about soldiers. We are not talking about anybody else. It is my experience in 36 years in the Army that all of the soldiers that go into the CID know that they are monitored and big brother is watching.

I might expand on that just a moment, if you will, addressing myself to the thrust of your question earlier about people who had not conducted a live examination. This is one of the ways where our provost marshals, and I myself have done this, our local provost marshal and CID commanders can observe the examiner, can observe his conduct and can observe the suspect and see how he is conducting his examination.

In case of females being examined, it is absolutely essential that you have some way of controlling or monitoring the examination.

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Mr. REUSS. I am not suggesting that you should be prevented from observing the polygraph testing process, or that it should be disallowed as a tool of instruction. What I am suggesting is that if you are going to have people behind the two-way mirror you should tell the accused about it. Is it your position that you should not do that? That this is unreasonable?

General BUTCHERS. It is my position that they know it, sir. I have to think about what this would do to the examination if you told him this.

Mr. REUSS. With all due respect, General, I think your position that they know it involves a most unmilitary assumption on what these 4,400 people did last year. I don't see where you come to that conclusion since nobody was required to tell them this. Maybe after this hearing they will know it, but I think they should have known it beforehand.

Colonel RUDZIAK. Can we say for the record that there is no prohibition in any of our directives to so advise or fail to advise, and in usage generally, in common usage, it is pretty well understood that the people know that this is going on.

Mr. REUSS. Would you take this matter up with the authorities, including Secretary Ailes, who I feel confident would be alarmed and let us know during the pendency of the hearing whether you propose to amend those regulations to include an instruction to the operator or other qualified authority to notify the accused of the presence of a two-way mirror and of a concealed microphone.

General BUTCHERS. Very well, sir. I will comply with that.

Mr. MOSS. Let us take a look at a hypothetical case here of what could happen. We could have a 25-year-old warrant officer, with 1 year of investigative experience, having just completed the course at Fort Gordon, and assigned to your duty post, initiating on his own, under the general authority derived from the commander of his base or duty station, a polygraph examination of a young 17-, 18-, or 19-year-old military, we will say, private, who is being investigated for some infraction, which would bring forth upon conviction a criminal penalty.

It could well be something that under civil law would be a misdemeanor. You take him into this room and you assume that they know their rights. They have been given the general instructions at some point that in the course of the investigation anything they use or say might be used against them.

They are not forced to give evidence against themselves. Am I right so far?

Colonel SULLIVAN. We don't assume that he knows his rights. These have been explained to him and he has been specifically asked, does he understand.

Mr. MOSS. We will reach the assumption in a moment, because investigations can sometimes be rather prolonged. A new element is introduced. He is asked if he would be willing to take a lie detector test. Actually that is a very broad misstatement to say a lie detector test because it would appear from the evidence before the committee the last 3 days from the gentleman mostly involved in the exploration of the use of this type of equipment, that there is no lie detector but the operator himself.

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Nevertheless, he is asked to submit to an examination while being hooked up to this machine. At this point there is no further instruction given him except that this is a voluntary act on his part.

General BUTCHERS. This is not correct, sir.

Mr. Moss. That is what I want to find out.

Mr. BECK. May I take this one.

General BUTCHERS. There is one thing I would like to introduce into the record here, if I may. The polygraph examination statement of consent, which must be signed before witnesses by the examiner.

Mr. Moss. Do we have a copy of that?

Colonel RUDZIAK. You should have some copies.

General BUTCHERS. I can give you this one (DA Form 2801). It reads:

In the presence of the witnesses or witness whose signature or signatures appears below, article 31 of the Uniform Code of Military Justice and the fifth amendment to the Constitution of the United States (strike out only if person completing a statement is a member of the Armed Forces), has or have been read to me by—

and then it goes on down the line.

He explained to me the nature of the polygraph examination and told me I cannot be required to submit to such examination without my consent.

He explained to me that I do not have to make any statement whatsoever but that any statement I do make may be used as evidence against me in a trial by court-martial or in any other military or juridical proceedings. Understanding my unqualified right to refuse, I—

with his name—

do hereby, this date, voluntarily without duress, coercion, unlawful inducement, or promise of reward submit to a polygraph examination.

Mr. Moss. At this point does this hypothetical youngster have counsel?

General BUTCHERS. If he asks at any time.

Mr. Moss. If he asks. He could be 17 years of age.

General BUTCHERS. This is correct.

Mr. Moss. Is this the total of the instruction given him at that point as to his rights?

Colonel RUDZIAK. Negative, sir. May I take that, sir?

Mr. Moss. What additional instruction is given?

Colonel RUDZIAK. He is advised of his rights under article 31. I would like to read out of our guide manual (TB PMG 22) to all of our polygraph examiners, sir, this one paragraph, which is paragraph 10(d) in this manual:

Before a person subject to the Uniform Code of Military Justice is asked to sign a statement of consent—

which is that paper you have before you—

he must be qualified and fully informed of his rights under article 31 of the code. The mere reading of article 31 is not enough. The examiner must explain in language the person can understand.

The person must be informed of the offense of which he is suspected or accused. The examiner must emphasize that the test is given only to a person who voluntarily agrees to it and that no person can be forced to take it or incriminate or degrade himself in any way.

The explanation of article 31 and the signing of the statement of consent should be accomplished in the presence of one or more witnesses other than the examiner.

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This is our Bible, sir.

Mr. Moss. All right. This is the instruction he has then had. You take him into a room where he is then observed in the course of the examination.

General BUTCHERS. Not yet, sir.

Mr. Moss. What do you do before that.

General BUTCHERS. This is the preexamination period. If I could have Mr. Beck describe the preexamination period.

Mr. Moss. He sits down with the examiner. The examiner goes over with him and reviews questions and talks to him in order to formulate questions.

General BUTCHERS. The examiner and the investigator make up the questions. These questions and only these questions that are listed here are to be asked and it is clearly understood by this 17-year-old soldier that these are the questions and only these questions that are to be asked.

Mr. Moss. Those are the questions to be asked.

General BUTCHERS. This is before he goes into the polygraph room.

Mr. Moss. Is he further advised that during the course of this discussion if he, through inadvertence, touching upon anything else which he may ever have done, that this information, even though no charge is pending, could well become the basis for a charge in some other forum?

Mr. BECK. May I explain how this works, sir. He is not advised of this in this manner. But what happens is this. If the man inadvertently starts to make an admission of some other nature the examiner must immediately stop his question and read article 31 again.

We are required to do this. Then re-advise him that he is now in another field which could incriminate him and ask him if he still wants to go on with his statement.

Mr. Moss. In the course of an extensive investigation of such a youngster, is he advised beforehand that anything he gives that would give any indication of any sort of an involvement before coming into the service, or during his period in the service, any of this could be used against him?

Colonel RUDZIAK. In article 31, sir; yes, sir.

Mr. Moss. You are taking a special procedure here. One, you try to get the confidence of the man. You want him to be relaxed. You want a friendly atmosphere. You are going to try to produce the ideal conditions, the rapport between examiner and subject.

Is he advised then at the beginning of this—specifically advised—that in this procedure, in a relaxed informal type of discussion, that anything that he says, touching upon anything unrelated to this charge, can also be used against him.

Mr. BECK. It is covered in article 31, sir, which says anything he says can be used against him. The explanation varies with the intelligence of the individual. This again is a field examiner's choice that depends upon the examiner subject relationship.

If the subject is of such a mental caliber that he must have everything explained to him, the examiner explains it. We cannot afford to take chances and let something go through here which will be injurious.

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Mr. Moss. Let me say a person at the age of 17, 18, and 19—he could have a very large potential of intelligence and in this completely alien field be totally ignorant.

Mr. BECK. Sir, we are required to explain this article fully. Whether he has the full intelligence or not, what I meant to infer before, if he lacks full intelligence, if you want to put it that way, we must go into deeper depth.

Mr. Moss. Could a month or two lapse between the initial charging of a person and the investigation given him as to his rights under the military law without any re-advice rather than the signing of this paper before he goes into the polygraph booth?

Mr. BECK. No, sir; he is re-advised by the examiner each day he goes in.

Mr. Moss. All right, as long as he is re-advised, and that that is a firm policy.

Mr. BECK. Yes, sir.

General BUTCHERS. Yes, sir.

Mr. Moss. Is he then advised that he is going to, in the course of the examination, have all his responses recorded?

Mr. BECK. Certainly; yes, sir.

Mr. Moss. And they can then be reviewed?

Mr. BECK. I am sorry. I want to ask one question. Recorded mechanically?

Mr. Moss. By electronic equipment.

Mr. BECK. No, sir; most times we don't do this. What I mean is we we don't record it most times.

General BUTCHERS. I think you are off the questions.

Mr. BECK. I am sorry.

General BUTCHERS. Mr. Chairman, could we have the question again?

Mr. Moss. Let me first read from page 93 of FM–19–20, Instruction Two, the lie detector room:

> This room should be approximately 12 by 12 feet in size and soundproof walls and for acoustical reasons be provided with a wall-to-wall floor rug. It should be equipped with concealed microphones connected to monitoring and recording equipment located in the adjacent observation room. There should be sufficient electrical outlets to service required equipment.

It goes on:

> Ideally, the room should be air-conditioned. Otherwise careful provision should be made for ventilation and air circulation.

Is the subject advised that these rooms are equipped with microphones, and this is going to be recorded?

General BUTCHERS. We have answered that in the negative, sir.

Mr. Moss. Nor is he advised that he is probably under observation from others than those in the room?

General BUTCHERS. We have answered that in the negative. We honestly don't know this. As a matter of practice, we believe that the subject does know it. However, I have received a directive to study this and take it up with the Secretary of the Army as to whether or not the policy should be changed.

Mr. Moss. Incidentally, this is an interjection of another point in here, but I would be interested to have comment on this. On that same page, under paragraph 2–D, I was interested in noting that sufficient

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incandescent lighting should be used to insure ample illumination of the entire room. Experience has shown that fluorescent lighting is usually unsatisfactory, because certain lie-detection electrical tracings may be altered by alternating current radiation from the light source.

How was that determined?

Mr. BECK. Your question, sir, will be——

Mr. MOSS. How is it determined that fluorescent lighting could alter tracing?

Mr. BECK. I do not know the technical reason that fluorescent lights affect some galvanometers. It is known that fluorescent lights and sometimes two-way radios such as police radios do interfere but I do not know the technical explanation why this occurs.

Mr. MOSS. If you have a subject in a room that is lighted by fluorescent lighting, then how do you compensate for the interference with the tracings?

Mr. BECK. There are two ways, sir. One, we usually ground it out. If we can ground it out with the ground wire, this ends the problem. If not, we then request the engineers to install the newer type fluorescent lights.

Mr. MOSS. Do you ever take polygraph examinations in rooms equipped with fluorescent lighting that have not been successfully grounded out?

Mr. BECK. Have I taken them? I have never taken an examination.

Mr. MOSS. Are they ever taken?

Mr. BECK. I can't answer that, sir. I do not know. As far as I am concerned, certainly not. As far as anyone in the commercial field I can't answer this. I have no way of knowing.

Mr. MOSS. The instruction was advisory. It didn't say you must have these conditions prevailing.

General BUTCHERS. Wouldn't it have a uniform distortion, Mr. Beck?

Mr. BECK. Yes, sir. What occurs in there, where the galvanic skin response tracing has a normal flow, it will have a jagged flow and we recognize it for what it is worth. We can't always recognize it. Many times we have to call in electronics technicians. We are not. When something of this nature occurs there is something remiss. If it is not in the mechanical deficiency we call in the technician.

Mr. MOSS. I was wondering how the operator differentiated between an electrical interference and disturbance and a physiological disturbance.

Mr. BECK. In the jaggedness of the tracing, sir.

Mr. MOSS. Is it an established fact that there could be no physiological condition that would duplicate that?

Mr. BECK. I couldn't say that, but I would say it is highly improbable.

Mr. MOSS. I only observe, Mr. Beck, that you answer that with a lot more assurance than I could. On the matter of physiology, I would like to seek very expert advice in making that assertion.

Mr. Kass, you may continue.

Mr. KASS. Mr. Beck, you made an interesting statement before. Could you clarify it for the record. You say two-way radios can also affect the polygraph?

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Mr. BECK. I only state from our experience at the school. Next door to our particular school is a model military police station that has a radio in it. They have problems there involving military apprehension which doesn't involve our school. When they are broadcasting sometimes, certain of our instruments will pick up these jagged lines. We can recognize them.

Mr. KASS. Which of these instruments will pick up these jagged lines as the result of the two-way radio?

Mr. BECK. This is an indefinite thing. It occurs spasmodically and in no particular room. It floats. It is atmospheric.

Mr. KASS. Which one of the charts?

Mr. BECK. Any of them.

Mr. KASS. Would it also—I believe you also said it would affect the galvanometer.

Mr. BECK. This is what it does affect. Only the galvanometer.

Mr. KASS. Only the galvanometer?

Mr. BECK. Yes, sir.

Mr. KASS. General Butchers, are you familiar with a detectograph manufactured by a Japanese firm, which is this?

General BUTCHERS. May I see that a little closer? I have a toy that I got in Japan a year ago and I think we have the same thing.

Mr. KASS. I didn't refer to it as a toy. I call it a galvanometer.

General BUTCHERS. This says a detectograph, does she or does she not? Is that the sort of thing you have there? [Laughter.]

Colonel RUDZIAK. Let the record show they are identical.

General BUTCHERS. The color is different. Mine is a black one.

Mr. KASS. Would that affect the reading?

General BUTCHERS. I have never been able to make this work successfully.

Mr. KASS. General, to your knowledge, has this ever been used in the Department of the Army?

General BUTCHERS. No, sir; only as a parlor gag.

Mr. KASS. Officially, as a parlor gag or unofficially?

General BUTCHERS. I refuse to answer that question. [Laughter.]

Mr. KASS. General, to your knowledge has anybody ever given serious thought to using this galvanometer?

General BUTCHERS. To my knowledge, I don't know the answer to that. I really don't know.

Mr. KASS. Has anybody given thought to using a galvanometer in the Department of the Army?

General BUTCHERS. In the Department of the Army?

Mr. KASS. In the Provost Marshal's Office.

General BUTCHERS. No; negative. This is just a gag.

Mr. KASS. General, we have had some reports that a similar-type instrument, perhaps after yesterday's discussion I should not call this an instrument, but that a similar-type gadget had been considered to be used in Vietnam. Could you comment on this for the record?

General BUTCHERS. I believe the committee has already received a classified report on the incident that was reported in the press in Vietnam. This was not under my purview in any sense. Knowing of the committee's interest in the matter, the Department of the Army has sought to get further amplification. These replies have not yet been received. When they are received then they can be submitted to the

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committee. I have no knowledge—no personal knowledge—of the event.

Mr. KASS. General, without divulging the confidentiality which I take it is based on protecting our national security, could you comment what this confidential letter stated, and in effect declassify what you can?

General BUTCHERS. I can address myself to this piece of equipment and the one you have there and say that it has never been used in any military police criminal type of investigation.

Mr. KASS. That was not the question, General. The question was, has it ever been contemplated to be used?

General BUTCHERS. As far as military police are concerned, negative.

Mr. KASS. Are you familiar with this confidential memorandum dated March 9, 1964, which the committee received?

General BUTCHERS. I have already commented that I am familiar with that in a general sort of a way.

Mr. MOSS. We will go into the subject of the intentions or lack of intentions and the matter of the portable galvanometer in an executive session, if it becomes necessary.

General BUTCHERS. In the meantime, Mr. Chairman, do you desire these reports that will possibly come in from Vietnam?

Mr. MOSS. Yes; we would like to have them.

General BUTCHERS. I don't know when they will be in. I understand a query went out about the first or second of the month. A second query has gone out to follow up. General Harkins has not yet replied.

Mr. KASS. Let the record state at this point that one of the queries was to declassify this confidential message.

General BUTCHERS. Yes, sir.

Mr. KASS. To get back to a different point, somewhere in your discussion, Colonel Sullivan, you mentioned the fact of your use on soldiers. Did I understand you to say that you also use the polygraph on civilians?

Colonel SULLIVAN. I don't remember the first statement, really.

Mr. KASS. Then the question would be, has the Department of the Army, the Provost Marshal's Office, used the polygraph on civilians?

Colonel SULLIVAN. Insofar as our CID, I am only qualified to speak for this phase.

Mr. KASS. Would you identify CID?

Colonel SULLIVAN. Military Police Criminal Investigation Division. The investigation of a suspected criminal act would be directed toward a person subject to the uniform code of military justice. If it were a civilian who came under this code, then, yes. If he did not, no.

Mr. KASS. Would you read him the article 31?

Colonel SULLIVAN. The same procedures would be gone through.

Mr. KASS. Or the fifth amendment to the Constitution?

Colonel SULLIVAN. Yes. In other words, he would be warned of his rights.

Mr. KASS. Do you also give polygraph exams to civilian dependents? Children?

Colonel SULLIVAN. No; not unless they are subject to the Uniform Code of Military Justice. This is the guide.

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Mr. KASS. Are children subject in any way to the uniform code of military justice?

Colonel SULLIVAN. Not to my knowledge; no, sir.

Mr. KASS. Could we, for the record at this point, Mr. Chairman, get a statement from them on whether a child is eligible or is covered under the military code?

Mr. MOSS. Yes.

Colonel RUDZIAK. He is not.

Mr. KASS. He is not?

Colonel RUDZIAK. He is not.

Mr. KASS. To return to your training course, Colonel Sullivan, you say this is a 7-week course?

Colonel SULLIVAN. Yes, sir.

Mr. KASS. How long has this been a 7-week course?

Colonel SULLIVAN. The exact date I don't recall but it was last year. Approximately a year.

Mr. KASS. What was it prior to that?

Colonel SULLIVAN. It was 1 week longer, it was 8 weeks.

Mr. KASS. How long was it, 8 weeks?

Colonel SULLIVAN. To Mr. Beck's knowledge who is better informed on this since the course started.

Mr. KASS. Mr. Beck, since you are better informed on this, somebody stated the course was formed in 1951.

Mr. BECK. Yes, sir.

Mr. KASS. At that point, it was an 8-week course?

Mr. BECK. The best I can determine; yes, sir.

Mr. KASS. Why was a decision made last year to drop it down to 7 weeks?

Mr. BECK. We reevaluated the course and determined that there was a lot of nonessential material in it that should be taken out, such as we had taught 30 hours of mechanical training which involved the nuts and bolts of the instrument. We figured that this is just too much for a man to absorb. It is not necessary that he know the identification of each part inside. So, we cut this phase out of it and took it on down to get to the meat of mechanical training. We had a 2- or 3-hour block, I can't recall exactly, of normal psychology. We had at that time with us a psychologists who was teaching, CWO Robert Berry, who has had several courses in psychology.

Mr. KASS. Would you identify him?

Mr. BECK. Chief Warrent Officer Berry. He had several courses in psychology.

Mr. KASS. But you also stated he was a psychologist.

Mr. BECK. No.

Mr. KASS. He has several hours in psychology.

Mr. BECK. I don't mean to infer he has a degree in psychology. He has a baccalaureate—I can't state what that is in. He is attempting a teaching career. I don't know his background.

Mr. KASS. That is all right for his record. You cut out a 3- or 4-hour course in normal psychology?

Mr. BECK. Yes. This doesn't bother us. We want our students to look for an abnormal individual. This was to us fat which we cut out of the course. In addition to this, we had a complete review of military law as applied to criminal investigators since they work with

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us on a daily basis, we cut out that portion of it and concentrated on the law as it applied to article 31 covering this, the rights of the subject. We cover this with a 2- or 3-hour block and the law as it applies or has been reviewed, I don't know how to state it, in regards to polygraph training.

Mr. KASS. You cut out 5 hours?

Mr. BECK. We cut thatf rom 9 to 5.

Mr. KASS. That is about a day you cut out. What else did you cut out?

Mr. BECK. We cut out some of the practical exercises. We used to give several demonstrations which were repeats of each other. We could see no reason to do this. We gave one complete demonstration of a test so that the student will know what it looks like and don't demonstrate the rest.

Mr. KASS. In other words, after the 7-week training course you didn't think it was necessary to add another week of practical application?

Mr. BECK. The practical application remained almost the same. That just stayed about constant. We had cut the "fat" out of the rest of it.

Mr. KASS. Could you cut your course down to a 2-week training course?

Mr. BECK. Absolutely not.

Mr. KASS. Why not?

Mr. BECK. Because we feel now we have what we call a balanced program of instruction. This we have determined, as we call it, user comment, the students themselves, who are given along about the first week in the course a book which they retain through the course and enter the comments in the book, such as the things they don't like about the course, suggestions that they may have relative to improving it. We take and evaluate each one of those suggestions and utilizing this along with our faculty board, the curriculum planning board, I am sorry, correction, the program of instructions built on its present foundation.

Mr. KASS. You said you could not cut it down to a 2-week training course. Is that my understanding?

Mr. BECK. That is your understanding, sir.

Mr. KASS. I understand you were in the audience yesterday and heard the witnesses speak about the ideal, 6-month training course. Do you think that your course, 6 or 7 weeks, whatever it may be, is adequate to turn out competent polygraph examiners?

Mr. BECK. We have found it in our opinion to be so, sir.

Mr. KASS. Have you ever made any statistics of the competency of the polygraph examiner?

Mr. BECK. Statistics are a relative thing and depend on many factors. We have been asked informally a number of times to determine how we could make a statistical analysis of the field of lie detection and we have been unable, since we are not statisticians, to come up with any kind of an answer because of the variables. Types of instruments come into this, training coming into it. Length of the courses would come into it, naturally. There are many variables which make this thing—I wouldn't know how to do it, sir.

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Mr. Moss. Are the types of instruments the Army used polygraphs—in other words, where you have more than one graph recording the responses of the subject——

Mr. BECK. We used multichannel lie detectors containing no less than three components. No more either.

Mr. Moss. Nor no more?

Mr. BECK. Yes, sir.

Mr. Moss. Then as far as the instrument is concerned, you are getting a recording of respiration, of the stimuli of the skin?

Mr. BECK. Electrodermal skin response.

Mr. Moss. And of blood pressure.

Mr. BECK. Those are the three components.

Mr. Moss. And any reliable instrument can measure these with accuracy.

Mr. BECK. The instrument itself only records that which the body puts out.

Mr. Moss. That is right. Is there significance in the difference of the make or manufacture of the machine?

Mr. BECK. Not any more, sir. Not basically. I am not completely familiar with the innards of the instrument, but they are very, very similar. To all intents and purposes as far as we are concerned, we can discern no appreciable difference between the two main manufacturers in the quality of their products.

Mr. Moss. I just wanted that clarified for the record.

Mr. BECK. Yes, sir.

Mr. KASS. At this point, Mr. Moss, I have no further questions.

Mr. Moss. Mr. Reuss.

Mr. REUSS. I would like to ask whether this so-called portable lie detector operated by batteries is a device which instead of testing blood pressure, respiration, pulse and skin sensitivity, just tests the latter—skin sensitivity or pressure. You may want to refer to one of your associates, General.

General BUTCHERS. I think you were out of the room when we discussed this.

Mr. REUSS. Yes; I was.

General BUTCHERS. This is one that was discussed here that simply measures the skin response.

Mr. BECK. I wouldn't know what to call that thing. It purports to measure galvanic skin response. I don't know whether it does or not. Apparently this is a transistorized galvanometer of sorts. I have not had it apart. I can't make a comment on it, sir.

Mr. REUSS. If it doesn't, in fact, measure galvanic skin responses, it is, of course, worse than worthless. But if it does, in fact, measure galvanic skin response, would you recommend the use of such a device for any lie detection purposes whatever?

General BUTCHERS. Negative. We would never recommend it. We believe in the three components.

Mr. REUSS. Would you state those three again?

General BUTCHERS. Do you want to take that?

Mr. BECK. Yes, sir. Blood pressure, breathing, galvanic skin response.

Mr. REUSS. I have before me an Associated Press story dated February 28, 1964, from which I will quote.

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SAIGON, VIETNAM, Associated Press.—The United States will introduce portable lie detectors on the battlefield of South Vietnam soon in a setup in sophistication of the war—

it says "setup," I imagine it meant "step-up"—

in sophistication of the war against Communist Vietcong Communists. A U.S. spokesman said today that lie detectors have already had positive results on experimental tests on 10 Government soldiers based in a compound outside of Saigon who were suspected by a U.S. adviser of being disloyal. Of the 10 tested, 1 proved to be a Vietcong agent, another used to be and a third occasionally assisted them. The lie detector which is spring operated from batteries already has been successfully used in counterinsurgency operations in northeast Thailand. One such detector is pocket size and can be operated by an ordinary soldier with a week's instruction. The main use of the detector will be to interrogate Vietcong suspects picked up in routine military operations.

My first question is, Is this use of the battery-operated lie detector within the domain of the Provost Marshal?

General BUTCHERS. No, sir.

Mr. REUSS. Would this be Army Intelligence?

General BUTCHERS. What you are talking there is screening counterintelligence and intelligence that would not be in our area. We are in criminal lines.

Mr. REUSS. Then I will just ask your opinion as an expert witness and that of your associates because this doesn't affect your operation. The hypothetical question which I would ask you is this. In view of what you have just said about the utter uselessness of the portable battery-operated galvanic response lie detector, this procedure by U.S. forces in Vietnam, assuming it has been accurately reported by the Associated Press is nonsensical; is it not?

General BUTCHERS. If he just used that type of instrument, I couldn't understand it.

Mr. REUSS. Again, I am just reading from this article.

General BUTCHERS. Is that Mr. Lucas' article?

Mr. REUSS. No, it is Peter Arnett. I have an article by Mr. Lucas here which I have not read myself. Was that to the same effect?

Mr. KASS. To the effect that the lie detectors are used in Vietnam and he defends the use of the polygraph but does not go to the galvanometer.

General BUTCHERS. The article, as I understood it, and the article of Mr. Lucas are sort of garbled. I don't really know what use you can make of a lie detector in screening and intelligence work. I am not in that line of business. I would say that you would get negligible results from this.

Mr. REUSS. Negligible results——

General BUTCHERS. You just get a laugh out of them.

Mr. REUSS (continuing). Are counterproductive results, aren't they, because if you do it at all you presumably do it because you think the results will be nonnegligible. Yet, if you make decisions as to whether somebody is or is not sympathetic to the Vietcong based upon a worthless test you are going to be producing some unsound military decisions, are you not?

General BUTCHERS. I would agree with that.

Mr. KASS. Colonel Sullivan, who, besides military policemen does the Fort Gordon School train in the polygraph?

Colonel SULLIVAN. In this particular field?

Mr. KASS. The polygraph.

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Colonel SULLIVAN. We received students from other Federal agencies and from the other Armed Forces.

Mr. KASS. By other Federal agencies you mean, for example, as the chart on page 14 of the committee's print shows, Army Intelligence, Air Force, District of Columbia Metropolitan Police Department, Marine Corps, Post Office Department; is that correct?

Colonel SULLIVAN. Yes, that is correct.

Mr. KASS. Your standards which you have stated earlier require for training purposes that a man must be minimum age 25, although this was questionable at the time, have at least 2 years of college, have the minimum grade of a warrant officer, and yet I have been looking down through the Post Office Department where the individual does not have to have 2 years of college and really can have only a high school diploma. Does this not fall under your standards which you set for training?

Colonel SULLIVAN. The standards are set for the military police criminal investigators who are to be polygraph operators. They are set to meet our requirements for the purpose that we expect to use this man and for the results we hope to get as an aid to investigation.

Mr. KASS. These are not the standards of the Polygraph Training School at Fort Gordon, Ga.?

Colonel SULLIVAN. Not of the school; no, sir. These are the standards for the individual.

Mr. KASS. What, then, for the record, are the standards of the Polygraph Training School at Fort Gordon, Ga.? What are the minimum standards for entrance?

Colonel SULLIVAN. For entrance for military police personnel the ones we have just been talking about.

Mr. KASS. In other words, you have no standards.

Mr. MOSS. Let us put that in clear context. The point Mr. Kass is attempting to develop on the record is that only on military police do you impose the standards set forth in your response to this committee; that for other agencies of the Government utilizing your facilities you impose no standards.

Colonel SULLIVAN. We do not; that is correct, sir.

General BUTCHERS. We accept the agency that sends the student according to their standards and according to their circumstances. They have decided what their standards will be. If they don't qualify in the course, they don't graduate.

Mr. KASS. Who sets the standards for graduation?

General BUTCHERS. We do.

Mr. KASS. Therefore, it is possible in the same training course to have a staff sergeant who is in the Air Force, a warrant officer in the Army Military Police, and perhaps a staff sergeant in Army Intelligence. You don't have the same standards?

General BUTCHERS. And an officer of the Army Intelligence.

Mr. KASS. I said the lowest standards.

General BUTCHERS. I will go all the way. It is possible to have a high school graduate from the Post Office Department, a staff sergeant from the Army, a sergeant from the Marines, an officer from the Army. All in one class.

Mr. KASS. General Butchers, would you clarify that last point? You said these would all be in the same training school taking the same course, sitting in the same room?

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General BUTCHERS. That is correct. I don't know that has ever occurred, but that is possible.

Mr. KASS. Could you find out if that has occurred?

Mr. BECK. Not in the order that the general gave but any of those people are eligible to attend and we have had all of those there. Yes, they are eligible to attend.

Mr. KASS. I see. Colonel Sullivan, is review possible? By review, I mean to review the case-by-case operations of the polygraph examiner.

Colonel SULLIVAN. I would like to refer that to the expert, Mr. Beck.

Mr. KASS. Mr. Beck?

Mr. BECK. If I understand your question, sir, you want to know if one examiner can read another examiner's charts, or if a central agency can do this. I don't quite get your question, sir.

Mr. KASS. Take your first point.

Mr. BECK. If another examiner can do it?

Mr. KASS. Yes.

Mr. BECK. If the other examiner knows the techniques used and is able to confer with the man who ran the test, he can assist in the evaluation. There are instances, if he knows the exact technique, the skill called standardized technique, he doesn't have to have been anywhere near when the test was taken. He can review the charts and assist in an evaluation.

Mr. KASS. Do you have standardized techniques within the Department of Army Military Police?

Mr. BECK. We do, yes, because we teach the same thing over and over again. But in the entire military police field these standards have not been attained as of yet because we have not trained or retrained everyone. We still have individuals, you see, who have been trained in the past and have not gotten this.

Mr. Moss. Can they be reviewed and a conclusion reached as to the truthfulness of the individual subject?

Mr. BECK. On the spot or in a central office? May I ask which? Either way?

Mr. Moss. Yes.

Mr. BECK. On the spot, if he is with the examiner almost any technique can be reviewed and either confirmed or denied. Sometimes no conclusion can be reached. I would be reluctant to state at this time that they could all be sent to a central office because of the different techniques still in use.

Mr. Moss. Let us say you had a group of 20 in the completely standard technique, could any one of the 20 review and come to a conclusion on the work of any of the other of the 20?

Mr. BECK. This is all of one technique?

Mr. Moss. Yes.

Mr. BECK. Yes.

Mr. Moss. I find this very interesting. As I recall the procedure requires that the examiner-operator meet with the subject to be tested. Then, in the course of a careful, personal interview, he compiles a list of questions. On the basis of the response to those questions, he arrives at a judgment as to whether he has been dealing with a truthful person or not. Am I correct there?

Mr. BECK. Yes, sir.

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Mr. Moss. I understood that the interview with the subject formed the basis upon which questions were then drafted. How could an evaluation or review, looking toward a conclusion of truthfulness, be made without the personal interview?

Mr. BECK. On the basis of the questions and the notes, and, of course, the discussion with the other examiner.

Mr. Moss. This would have to be a very precise science then, wouldn't it?

Mr. BECK. No. This science is far from precise at this time. We hope it will eventually get there but it is not now.

Mr. Moss. Aren't there two very important factors here? The person being interviewed and the interviewer?

Mr. BECK. These are the two individuals involved, yes, sir. These are important factors.

Mr. Moss. Then, how can you arrive at a judgment of truthfulness unless the opportunity to interview is present?

Mr. BECK. You had asked me, sir, if we could evaluate the charts, not the man. This is what I took you to mean.

Mr. Moss. The charts only show response on these meters.

Mr. BECK. From the three components.

Mr. Moss. You can't just take the charts and say, "This is a truthful person or a liar."

Mr. BECK. In the standardized technique we do it at the school now, sir. We cannot evaluate our students if we don't do it. We read their charts.

Mr. Moss. In other words, I could hand you a bunch of charts now and you could review them and you could say, "This is a truthful person," and, "This is not."

Mr. BECK. I wouldn't say that. I would say, "That is my opinion." I would then, from reading the charts, arrive at my conclusion. I would have to have the questions, sir.

General BUTCHERS. You would have to have the circumstances, too.

Mr. Moss. What is the most important part of this procedure, the machine or the operator?

Mr. BECK. I am sorry, sir, there was a distraction and I missed the question.

Mr. Moss. What is the most important part of this procedure, the machine or the operator?

Mr. BECK. The examiner, the operator. He runs it.

Mr. Moss. If you were deciding percentages, what weight would you give to the machine and what weight to the examiner?

Mr. BECK. I can't cite a percentage. I have no way of arriving at a percentage.

Mr. Moss. Would you break it 50 percent on each?

Mr. BECK. I wouldn't break it either way, sir. Here we have this relative factor coming in again. The ability and the competence of the operator. This is a deciding factor in any test. Here, we have these variables floating around again.

Mr. Moss. The ability and the competence of the operator is the most significant factor that comes into this whole procedure.

Mr. BECK. Absolutely.

Mr. Moss. Then, even though there is a standardization of technique, and you use this zone comparison technique—am I correct on that?

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Mr. BECK. Yes, sir.
Mr. Moss. This is the one you teach at Fort Gordon?
Mr. BECK. I am not sure that is the one I teach. We teach one down there; yes, sir.
Mr. Moss. You teach the Backster zone comparison technique?
Mr. BECK. Not right down the line. We reserve the right to vary to fit our needs.
Mr. Moss. When you vary, what do you use?
Mr. BECK. We use what might be called a modified Backster zone comparison technique.
Mr. Moss. What brings about the modification?
Mr. BECK. We have found that by combining a technique that he used to use and the one he now has we get better results for our purposes.
Mr. Moss. In what way are the results improved?
Mr. BECK. We find that our students are better able to arrive at a conclusion on their tests. A logical conclusion.
Mr. Moss. Who devised the new technique?
Mr. BECK. The one we use?
Mr. Moss. Yes.
Mr. BECK. We did at the school.
Mr. Moss. Is this a conference procedure to review the curriculum and revise it?
Mr. BECK. Conference with the instructors and the students; yes, sir.
Mr. Moss. Do you have an instructional handbook that sets forth the modifications for the differences?
Mr. BECK. This is taught in our course, sir. We don't have an instruction handbook like this. Lesson plans and the handouts we give to our students.
General BUTCHERS. That is your handbook.
Mr. Moss. I notice here in the lesson title, this is the conduct of Backster zone of comparison tests. Then the comment:

You have now learned the principles of the Backster zone of comparison test.

Is this an instructor's plan?
Mr. BECK. This is the lesson plan that the instructor teaches from.
Mr. Moss. Do you have textbooks?
Mr. BECK. We have handouts. Advance sheets, summary sheets, fact sheets, various types of handouts. Nothing like that book, sir.
Mr. Moss. Do you use these forms?
Mr. BECK. Only in an advisory capacity. No, sir, we cannot afford to use those forms. There is a cost basis on those that we are unable to finance.
Mr. Moss. What do you do then, in the operation of this zone comparison technique—do you develop your own forms?
Mr. BECK. Yes, we have a form developed. It is overprinted on our military form. We do not use the numbering system Mr. Backster uses. We find it somewhat unwieldy for our purposes.
Mr. Moss. I find I am a little confused. I had reviewed the material supplied, the program of instruction for polygraph transition course and the polygraph course, program of instruction. I notice practical exercise in the conduct of Backster zone comparison test and interpretation of charts to determine specific response. You identify

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rather consistently much of the material as Backster material and course of instruction. But the fact is that is not what you use. You use it in a modified form.

Mr. BECK. Yes, sir. We use the Backster name because he originated this technique and all of his basic principles are employed. We might switch the questions around. This is what we do in substance. We switch the questions rather than other techniques built into this.

Mr. Moss. In starting the school in 1951, did you start with the Backster technique?

Mr. BECK. No, sir. I said no, sir. I should not have answered quickly. I don't know what they started with. But the Backster technique was not in existence at this time, so "No, sir," would not be correct. I was not there in 1951, sir.

Mr. Moss. You are a polygraph operator, yourself?

Mr. BECK. Yes, sir.

Mr. Moss. Do you use the Backster technique?

Mr. BECK. Do I now, yes, sir. Let me qualify. Except in the school I do not operate. I am an instructor.

Mr. Moss. You are an instructor in the polygraph technique itself?

Mr. BECK. Yes, sir.

Mr. Moss. Do you feel that a 7-week course is fully adequate to train a person in the use of a polygraph?

Mr. BECK. Yes, sir.

Mr. Moss. It gives all the physiology and psychology that is required?

Mr. BECK. This is our opinion, that we do provide sufficient for our needs for our students.

Mr. Moss. Has the school at Fort Gordon ever consulted with the Medical Corps of the Department of the Army to request their cooperation in evaluating any of this material?

Mr. BECK. No, sir. Again, I answer advisedly. Since I have been there.

Mr. Moss. General Butchers, has the military police consulted with the Medical Corps of the Department of the Army to undertake any evaluation either of techniques or of training material employed in the teaching of the polygraph operators?

General BUTCHERS. At my level, no. Let me verify with CONARC.

Colonel RICHARDSON. I can't say that we have, in my personal knowledge.

Colonel SULLIVAN. Not to my knowledge.

General BUTCHERS. Not to our knowledge. I can check this out and give you a complete answer, if you will.

Mr. Moss. Colonel, you responded to the question there. Would you identify yourself for the record?

Colonel RICHARDSON. I am Col. Robert E. Richardson, provost marshall of the Continental Army Command. I am not here officially as a witness. I am an adviser.

General BUTCHERS. The question was to consult with the surgeon as to the——

Mr. Moss. The adequacy of the instructional program in physiology and in psychology. I would say, have you ever requested a medical audit of the techniques and evaluation of the many assumptions that I assume must be made by these operators if they are going to interest physiological responses of the human body?

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General BUTCHERS. May I provide that for the record, sir?

Mr. Moss. Yes; if you would, please.

(The material to be furnished follows:)

The information available at this time is that at the time the polygraph courses were being established at Fort Gordon, Ga. (early 1951), consultations did take place with qualified medical authorities on the instructional program as it pertained to physiology and psychology. The blocks of instruction dealing with these subjects were initially developed by qualified medical doctors from the Augusta, Ga., medical center. The lesson plans developed were also subsequently reviewed and evaluated by medical authorities of the U.S. Army. Since the basic material was developed by competent medical authority, and the basic course on these medical subjects remained essentially unchanged, no further medical audit or evaluation has been made in recent years. In view of the interest raised by this inquiry, action has been taken by the U.S. Army Military Police School to obtain an objective medical evaluation of the instructional program by competent military and civilian medical authorities.

Mr. Moss. Mr. Beck, are there any conditions of health, physical or mental, which could cause responses on the polygraph which would duplicate the responses taken by the average operator to indicate lack of truthfulness?

Mr. BECK. I am trying to cast this question around to make sure I understand it. What you want to know, sir, is if, in my opinion, a medical or mental condition exists which could cause a man to record deception responses where no deception responses——

Mr. Moss. That is the terminology.

Mr. BECK. This is what I am trying to figure out. Changes from the norm. I know of none.

Mr. Moss. Do you know whether there is a normal response physiologically? Is there a normal response physiologically?

Mr. BECK. Certainly; there is a normal response in that any response that the man puts on is normal for him at the time he responds.

Mr. Moss. In other words, we have a normal response for that individual.

Mr. BECK. At that time.

Mr. Moss. Could this be affected by his physical or mental condition?

Mr. BECK. Yes, sir; particularly mental.

Mr. Moss. Are you able to diagnose physical or mental abnormalities, if you are using the term "norm" here, in this individual when you subject him to this test?

Mr. BECK. No, sir.

Mr. Moss. Do you have a sufficient knowledge either of psychology or physiology to make an evaluation of the responses which would rule out any such abnormality?

Mr. BECK. I know of no such responses, sir. But if this were so, we would not be able to recognize them; no, sir. We can make no diagnosis either medically or psychologically of an individual.

Mr. Moss. Do you know whether the subject when connected to this machine would have a different response if he were, say, a heavy smoker than if we was not a heavy smoker?

Mr. BECK. Now, we are getting to the crux of this thing, and what we do, sir, is a very simple procedure. We balance the individual into the machine and measure the deviations from the norm, whatever they may be at that time.

Mr. Moss. From what norm?

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Mr. BECK. We establish his norm when we have balanced the machine properly, have balanced his galvanometer properly, have balanced his blood pressure to where it is recorded properly and his breathing pattern and he is tracing along and we apply what we call stimulus to effect changes, such as snapping fingers, touching the short hairs back of the neck and so on, observe these changes and we know we are functioning properly. He is then balanced in. This is his norm. Then we read the deviation from this norm. This norm will change from day to day in any individual.

Mr. Moss. In other words, you try to get the subject as relaxed as possible and get the readings at that point, and then you start giving him the questions?

Mr. BECK. Yes, sir.

Mr. Moss. And the determination of his truthfulness is then taken by any fluctuations of blood pressure, breathing, or skin response during the course of the interrogation.

Mr. BECK. This in substance is so. We compare, as you say, fluctuations against the type of questions involved.

Mr. Moss. But you have no medical knowledge as to whether persons tend to respond in a similar fashion from that so-called norm regardless of their physical or mental condition?

Mr. BECK. I am sort of lost right now, sir.

Mr. Moss. Let me try to make this clear. You have a person who is going to take one of these tests. It might be a person who has very, very few problems, very placid sort of individual, no particular tensions. It might be another person who would appear to be equally placid but has a lot of tensions and a lot of problems. You get both of them into the chair and you are going to start with their reading as an indication to you as to any variation on their response. But do you know that the responses you would get on A would follow a similar pattern to B on the polygraph recordings?

Mr. BECK. They very probably would not because each individual will record his own pattern. Like an EKG, you will find a difference.

Mr. Moss. You think in the variations here that this could always be attributed only to their responses to the question given?

Mr. BECK. This is so, if I understand the question.

Mr. Moss. That is fine. You say it is so, this is the way you view it,

Mr. BECK. When the question is asked, the response to that question would be the person's normal response, whatever the question may be. This, I believe, is the question and answer.

General BUTCHERS. May I follow on to that?

Mr. REUSS. He didn't answer your question.

Mr. Moss. No.

General BUTCHERS. May I lead on from there.

Mr. Moss. Would you, General?

General BUTCHERS. I think what we are driving at here is an evaluation of the machine. We are really not competent to evaluate any of the instruments here.

Mr. Moss. No, General, I am not talking about the machine. I would readily stipulate for this record or the record of yesterday or the day before, that a polygraph will do three things with considerable precision. It will measure the flow of current or electricity on the skin. It will measure blood pressure very accurately. It will

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measure respiration very accurately. That is all the machine does. I might add if all these hearings produce is an understanding by the public that there is no lie detector, that will be of significance, I think. That is all that the machine does. Now, the interpretation of those responses by a human being is the lie detector and only that. Therefore, it is important that that human being, who is going to interpret these evidences of physiological changes be adequately trained, have a sufficient knowledge of human physiology and the human psychic, to correctly interpret them, if they are to become the basis for assuming either the guilt or innocence or the truthfulness of that individual being tested.

The thing I am increasingly convinced of is that in these instances of governmental use that type of training is not given, and that the individuals making these tests are assuming a scientific diagnosis with the scantiest of knowledge. The Government's use of these has led to a broadening of their use outside of Government. I think it constitutes a very dangerous invasion of our rights as Americans and as human beings, if we are to be called upon, to be judged by our physiological responses. Then we should have the most fully trained—I think they should be as fully trained as the man who takes the EKG and tells me whether or not I have a heart condition.

And 7 weeks—and I might add that the Reid method employed in part in your school, its very author said that a minimum of 6 months of training, I think they placed it as an absolute minimum. Mr. Backster would give no judgment of absolute minimums. But he was not willing to state that the 6 weeks or 7 was adequate. Mr. Beck feels it is adequate. That is the reason I have been asking these questions. I have a real concern, in fact, a firm conviction, of the complete inadequacy of the training. You can take people and put them through courses and have them take these machines, the less they know about them the more they are inclined to regard them as some miracle that is going to give them a guide as to the truthfulness of another humna being.

But I think in the hands of a doctor he would not be nearly as convinced of their infallibility.

General BUTCHERS. May I comment on this?

Mr. MOSS. Yes, sir.

General BUTCHERS. I agree with everything you said except one point I don't think we have gotten across to the committee. These responses that are interpreted by the examiner of deception or not deception are not the final answer. It is not truth or innocence or truth or deception. It is this that furnishes a lead for the investigator now to go out and get evidence. It is true that in a percentage of cases when you confront a subject with indication of deception that you will get an admission or confession at this time.

This is not necessary. The investigator then having interpreted the results of the test now must go out and ring doorbells and go through the hard work that he has not already done and develop these leads into evidence. This is the point I wanted to make, sir. I read here now from Mr. J. Edgar Hoover's position on this to which we fully subscribe:

> The name lie detector is a complete misnomer. The machine is not a lie detector. It shows variations of your blood pressure and of your emotions. The person who operates the machine is the lie detector by reason of his interpreta-

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tions. The machine technically is known as a polygraph. The man operating it must be extremely skilled and must be conservative and objective. He must be able to properly interpret the recordings made. However, when the human element enters into interpretations of anything, there is always a variance. I would never accept the conclusion of a lie detector as proof or innocence—

correction—

proof of innocence or guilt—all that it can be called is a psychological aid.

In that position our military police hold their case.

Mr. Moss. I have not the slightest doubt that every word you have said is the absolute truth. But I was impressed with the testimony of the gentlemen who have preceded you, with the frequency of the use of the terms "guilt or innocence," "truth or lie." I think in the actual use of these, the people who are actually using them, tend to become convinced that they are almost infallible. As the little insert given us yesterday by Mr. Backster from the magazine Bus Transportation, the mere use of these on an ever-broadening scale in Government leads him to believe that they are in fact lie detectors. You get these articles that say the scientific wonder, and with it all you have to do is set an employee down and ask him a series of questions and when you are finished you know if he has problems, you know if he is truthful, you know if he is honest, all of these things you know. The fact is, you know nothing. You may have many suspicions, but no more knowledge than when you started.

If you are really going to prove it out, then you have to go into the old procedure of investigating with the techniques established and recognized by our courts. Is the result of a "lie detector" examination, and I use that lie detector in quotes, used in military trials?

Colonel RUDZIAK. No, sir.

General BUTCHERS. It is not admissible in evidence either in courts-martial, sir, or in board proceedings. It is not evidence in any sense.

Mr. Moss. Of course, this affords a great deal more protection than a person has who seeks employment and is, in fact, finally judged by one of these devices. I suspect not in your shop, but in others of Government, that this little device has robbed many a person of an opportunity for employment or promotion. I have no doubt that under the conditions as spelled out here, the fact that it is not evidence, the safeguards around it, that the defects in training are perhaps overcome, because finally the poor person has a day in court. But in many of the uses that is not the case. Mr. Reuss, we are doing to have to recess. We have a quorum call. You may proceed.

Mr. REUSS. I have listened with interest, Mr. Chairman, to what you said about defects in training, and of course I agree with you. However, I must say at this point having heard the witnesses for 2 or 3 days, I have yet to see any convincing evidence that the so-called lie detector is of any legitimate use at all other than in its psychological effects on the subject, and this could be done with a box and some whirring noises and lights quite as well. I remind myself that for many centuries it was thought the proper method of treating human ailments was by bloodletting, and it was pointed out during this period in defense of bloodletting that many who had been subjected to leeching survived and even got better, although some didn't. It was only quite recently that the bloodletters were required to submit to more formal proofs and when they had to do so, new and better methods of medicine and surgery were evolved.

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Therefore, I am not at all sure that you couldn't send, let us say, Dr. Charles Mayo to lie detector school for 10 years and that he would be able to make any sense out of these apparatuses as far as detecting truth or deception is concerned. In this connection, let me ask the representatives of the provost marshal office, have you made independent studies and judgments of the efficacy of the lie detector method, or have you accepted on faith the common wisdom of the Nation which I must say is that a lie detector is something better than useless?

General BUTCHERS. We accept it as something better than useless.

Mr. REUSS. You didn't make any independent studies?

General BUTCHERS. Not to my knowledge. We have had several workshops and technical studies.

Mr. REUSS. If you have any shred of evidence that the lie detector has any use or efficacy other than in this rather illegitimate psychological side effect, would you file them with the committee? Because time is short I would then ask this question. In the last fiscal year, the provost marshal's office conducted some 4,400 lie detector tests. Obviously, many of these tests were conducted for the same crime. That is, you might have five suspects for one crime and give them all a lie detector test, and just making a wild guess, I would say that probably 1,000 or 2,000 or 3,000 separate crimes were involved in those 4,400 lie detector tests. The materials inherent in these tests are all still available. This subcommittee, either by itself or in conjunction with the executive branch, should put together a team of wise men, to include the dean of this law school, the chairman of this medical society, a Supreme Court Justice from that bench.

Would it be possible to make these materials available so that we could see whether lie detection is a valid method or whether it belongs under the general category of leeching and bloodletting.

General BUTCHERS. These tests probably are not available, Mr. Congressman.

Mr. REUSS. This is in the last fiscal year.

General BUTCHERS. They are destroyed a year afterward.

Mr. REUSS. You have a new batch in the files of about a similar number?

Colonel RUDZIAK. Yes.

General BUTCHERS. We are completely decentralized. This compilation that I have before me which is of the last few months bringing it up to the 23d of March has been obtained by considerable effort because of the interest of the committee. I have gone to Vietnam. I have gone to Okinawa. I have gone all over the world, to get this material together, simply as a statistic.

Mr. REUSS. If I may interrupt, if we ask for this, of course, we would try to accommodate our request to your needs and leave out Vietnam and faroff places. But you could get together a good representative batch, could you not?

General BUTCHERS. What I would like to get across, Mr. Reuss, is that we have to go out to the local commander, there to get into his files, there to obtain the material of which you speak. These cases that are closed—the investigative cases that are closed—are on file at Fort Gordon. I can get those quite readily. But they will not have the material you are seeking, I am sure. They will not have any of the

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investigative effort of the polygraph examiner. This by our regulations is prohibited from being filed in that area.

Mr. REUSS. That would be filed in the command area.

General BUTCHERS. All over the world.

Mr. REUSS. If we restricted our request, let us say, to the continental United States, it would be no great task to get that inspection.

General BUTCHERS. Would you limit your request to continental United States?

Mr. REUSS. Yes. I am not making the request right now. I am just exploring.

General BUTCHERS. We better get started working right away.

Mr. REUSS. Please don't get started because I am in no position to make a request now.

General BUTCHERS. Yes, sir.

Mr. REUSS. Since we don't know whether this is, in fact, of any earthly use or not, it seems to me before we continue with this elaborate apparatus it might be well to see what it is like. I want to thank you and all of you gentlemen for your most helpful testimony this morning.

The hearing will now stand in recess until 2 o'clock this afternoon in this room with the witnesses from the Department of the Navy.

General BUTCHERS. That will complete our testimony?

Mr. REUSS. Yes, thank you very much.

(Whereupon, at 12:25 p.m., the subcommittee recessed, to reconvene at 2 p.m. the same day.)

AFTERNOON SESSION

(The subcommittee reconvened at 2 p.m., Hon. John E. Moss, presiding.)

Staff members present: Samuel J. Archibald, staff administrator; Jack Matteson, chief investigator, and Benny L. Kass, counsel.

(Present at start: Representatives John E. Moss, Harry S. Reuss, and Ogden R. Reid.)

Mr. MOSS. The subcommittee will be in order. Our witnesses this afternoon will be Rear Adm. Rufus L. Taylor, Assistant Chief of Naval Operations for Intelligence; and Mr. J. M. Barron of the Office of Naval Intelligence. Will you gentlemen rise and be sworn?

Do each of you solemnly swear the testimony you are about to give this subcommittee will be the truth, the whole truth, and nothing but the truth?

TESTIMONY OF REAR ADM. RUFUS L. TAYLOR, ASSISTANT CHIEF OF NAVAL OPERATIONS FOR INTELLIGENCE; ACCOMPANIED BY J. M. BARRON, OFFICE OF NAVAL INTELLIGENCE

The WITNESSES. I do.

Mr. MOSS. Will you identify yourselves for the record?

Admiral TAYLOR. I am Rear Adm. Rufus L. Taylor, the Director of Naval Intelligence.

Mr. BARRON. I am John Barron, Office of Naval Intelligence.

Mr. MOSS. Admiral Taylor, I understand you have a statement.

Admiral TAYLOR. Yes, sir; I do.

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Mr. Chairman and members of the subcommittee, I am Read Adm. Rufus L. Taylor, U.S. Navy, and I am the Director of Naval Intelligence. It is my understanding that the subcommittee is interested in the use of the polygraph (lie detector) in the Armed Forces.

My statement here is given in two parts for clarity. The first part pertains to the Navy Department's policy and rules for the employment of polygraph techniques in investigations. Part 2 outlines the policy pertaining to polygraph operators.

PART I—POLICY AND RULES FOR THE EMPLOYMENT OF POLYGRAPH TECHNIQUES

The polygraph technique has been employed in investigative matters by the Office of Naval Intelligence since 1948. The machine used in the application of this technique is commonly called a "lie detector" which is a misnomer.

Correctly stated, the polygraph is a machine which is capable of producing a record of physiological phenomena which may be used as a reasonably reliable indicator for the detection of deception.

The machine will be ineffective with certain individuals for either physical or mental reasons. Included in this group will be mental deficients, alcohol or narcotic addicts, while under the influence, many hardened criminals, psychological liars, et cetera.

The experience of the Office of Naval Intelligence has indicated that the correct application of the subject technique is as an investigative aid. Our policy is to restrict its application to cautious use by skilled operators. We consider it as merely one of the many techniques of investigation rather than as a substitute therefore.

The polygraph technique is an invaluable aid to investigations. The correct application of this technique is as an aid to further investigation or interrogation. The polygraph itself does not have the property of evoking confessions; this remains the task of the skilled interrogator. Nor do we use it in any way as a threat to coerce a confession.

Polygraph operators within the naval intelligence organization are trained at the Office of Naval Intelligence and authorized to use the technique by the Director of Naval Intelligence. There is no objection generally to the utilization of persons as operators who have been trained elsewhere; however, where done, it is the responsibility of the respective officer in charge concerned to determine to his satisfaction that tests are conducted in accordance with Navy policy.

Policy and rules: The following regulations comprise the general policy and rules of the Office of Naval Intelligence in respect to application of the polygraph techniques:

(1) The technique will not be used as the sole determinant for eligibility for security clearances. Even in those cases where no other avenues of inquiry are available—for example, an escapee from an Iron Curtain country—the use of this technique alone to determine eligibility for security clearance is strictly prohibited.

(2) The technique is to be used in conjunction with and as an aid to investigation or interrogation, not in lieu thereof. It should not be restricted to use as a last resort, after all other techniques, particularly prolonged interrogation have failed; conversely, it should not be used prematurely; rather, its use should be applied as any investigative aid at the appropriate time relative to case development.

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This varies from case to case, but is usually confined to situations involving conflicting evidence, elimination of suspects, or pressure of time.

(3) Subjects cannot be compelled to submit to the examination and it is the operator's responsibility to insure that the subject realizes he cannot be ordered or forced to submit to the examination.

A waiver, setting forth the subject's agreement to submit to polygraph examination is obtained in each instance. In addition, the operators are charged to satisfy themselves as to the general health condition of the subject.

Prior to examination, the subject is queried as to his general physical condition. If he has a dangerous heart or blood pressure condition, we do not test. Also various other conditions can produce false reactions.

(4) The responsibility for determining whether the technique is applicable to a particular case or whether the issue is susceptible of resolution by the polygraph technique, is that of the duly authorized polygraph operator.

Local irreconcilable differences of opinion as to the applicability of the technique in a given situation should be referred to the Office of Naval Intelligence for decision.

(5) Polygraph operators submit opinions only. They do not state as a fact that "the individual told the truth" or "the individual lied." In the opinion of the operator, results may be positive, negative, or indeterminate. If an individual is considered unsuitable for testing, either temporarily or permanently, for some physical or mental reason, this also is stated as opinion only.

(6) Charts obtained by operators are retained in their files. Opinion of more experienced operators within the district may be sought. However, it is to be noted that ethical and experienced operators, as a general rule, will decline to venture an opinion or diagnose charts resulting from examinations conducted outside their presence.

(7) When the investigating agent is other than the polygraph operator, he furnishes to the operator all information he possesses concerning the case. The investigating agent indicates to the operator what information is sought and the operator in turn will compose the questions.

Questions must be posed with the utmost possible precision. They are short, avoid the injection of extraneous matter, worded so as to eliminate false responses caused by word association, and are capable of being answered with "yes" or "no" responses.

(8) Different categories of issues or offenses are not combined in one examination but each is made the subject matter of separate examinations; for example, when an individual to be tested is suspected of both unauthorized disclosure of classified matter and sexual deviation, separate examination on each offense is conducted rather than including questions about both offenses in the same examination.

In considering the order in which the issues are handled, consideration is given to which of the issues is liable to have the stronger emotional impact on the subject, rather than to which of the issues is the more important from an investigative or security viewpoint.

Thus, in the example indicated, even though the compromise is the more serious offense, the subject himself is apt to be more concerned about the sexual problem.

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Accordingly, this issue should be handled first, in effect, to "sanitize" the subject so that concern about the sexual issue on the subject's part does not becloud or distort his reactions in response to question concerning the compromise.

(9) We do not permit use of the technique as a "hunting license." Pertinent questions are restricted to those which are germane to the issue or issues on which the subject has agreed to be tested. Control questions may be used only as required to determine if the subject is capable of reaction to the technique or to determine the presence of a "guilt complex."

Furthermore, it is our policy to discuss with subject, the questions he will be asked before he submits to the test. Every effort is made to stick to the main issue and to avoid unnecessary personal or embarrassing questions.

(10) In order to be valid, a reaction must be repeated. A minimum of two charts is run in each case.

(11) In many cases an operator for naval intelligence will find himself in a situation where he must run a polygraph examination because of the exigency of the situation or because of the nature of the information received.

For example, investigative agencies constantly receive anonymous information. Often this information is of such a nature that some check must be made immediately; for example, a tip that John Doe has planted explosives aboard the ship.

Because the assumption cannot be made by an intelligence operator that this information is unreliable, it may be necessary to test John Doe on the possibility that he has actually hidden explosives aboard the ship.

On the other hand, when accusations are received, it is necessary in all cases, all other conditions being equal, to polygraph the accuser before the accused when polygraph examination is the course of action indicated by the information received.

(12) The operator includes as part of his report, or prepares a memorandum for the investigating agent to include with his report, the date and place of the examinations, number of tests administered, a list of all questions, relevant or irrelevant, employed, responses of the subject, and a statement as to his—the operators's—opinion of the results of the examination.

PART II—POLICY PERTAINING TO ONI POLYGRAPH OPERATORS

The Office of Naval Intelligence views on the polygraph technique, particularly in respect to its capabilities and limitations in connection with security clearances, was published as an article in the ONI review of July 1951. Our views have not changed materially since then.

As an aside, we have furnished to your chief counsel a copy of that report.

Mr. Moss. Thank you.

Admiral TAYLOR. From 1948 to 1951, ONI polygraph operators were trained at the Leonarde Keeler School in Chicago, Ill. From July 1951 onward, the Office of Naval Intelligence has conducted its own training course for polygraph operators.

This step was taken principally to insure selection of personnel with at least the minimum qualifications for such training and to stress

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an understanding of the Office of Naval Intelligence views in relation to polygraph techniques.

The Office of Naval Intelligence has never certified agents or special agents as polygraph examiners. Individuals selected by the Office of Naval Intelligence for training at the Leonarde Keeler School or at the Office of Naval Intelligence training school have been authorized by the Director of Naval Intelligence to conduct polygraph examinations, but not to provide training in polygraph operation. Wording of this authorization is as follows:

> Special Agent Doe is qualified as a polygraph operator and not as an expert. Although he has been given basic training which will lead to proficiency by the addition of experience and continued study and analysis of charts run by comparison with objective evidence where such is available, he is not considered sufficient competent to provide training in polygraph operation.

This authorization may be withdrawn at the discretion of the Director of Naval Intelligence for good and sufficient reason therefor.

The Director of Naval Intelligence authorizes polygraph operators who are trained at the ONI school or who were trained at the Leonarde Keeler School under ONI orders prior to July 1951 to conduct polygraph examinations when the technique is applicable to investigations being conducted by the Office of Naval Intelligence.

Operators who have received such authorization may be required to requalify at the Office of Naval Intelligence periodically in order to retain this authorization. The authorization may be withdrawn at any time by the Director of Naval Intelligence.

Other investigators currently employed by or on duty with the Office of Naval Intelligence who are trained in the use of the polygraph will not be authorized by the Director of Naval Intelligence as operators but may on occasion be authorized to conduct polygraph examinations by competent subordinate authority under suitable conditions.

These operators may be issued letters of authorization by the Director of Naval Intelligence after attending a refresher course or after demonstrating an acceptable degree of proficiency in operation and understanding of ONI rules for employment of this technique, at the Office of Naval Intelligence.

In summary, we view the function of the polygraph as an aid to interrogation. Interrogation is a specific investigative technique which in almost all cases follows and does not precede those other techniques which may be employed in a particular case.

We do not recommend utilization of the polygraph alone as an investigative technique except in the most unusual cases where, because of particular circumstances, no other avenue of investigation is open.

So far, it has been our experience that there are practical limits in the use of the polygraph. Some of these are: the fact that 75 percent represents a reasonably high percentage of cases in which examination on the machine produces definite and positive results; the fact that thoroughly trained, experienced and skilled operators who are completely objective in viewpoint are required; the fact that accepted and proper use limits the polygraph as but one of many scientific techniques.

The polygraph is a valuable aid in its proper place, but no more so than the technique of fingerprint examination and classification, ballistics, or the examination of question documents.

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That concludes my formal statement, Mr. Chairman. I am prepared to try to answer any questions you may have. I might suggest if the committee is willing to hear it, Mr. Barron, who is our principal expert in this field and trained at the Leonarde Keeler School, has a few informal remarks he would like to make, in which I concur, on the purpose that we have in the use of the polygraph, and what it is that we try to determine, pointed toward the fact that we are not trying to determine what the physiological reactions mean, but only what they are in relation to other circumstances where they are different.

With your permission, I would like to have Mr. Barron comment.

Mr. Moss. Mr. Barron, certainly you may proceed.

Mr. BARRON. Sir, if I may stand.

Mr. Moss. If you are more comfortable.

Mr. BARRON. I am more comfortable. First I understood Admiral Taylor to make an affirmative statement when it should be a negative statement. The sentence should read "The technique should not be used as a last resort." I understood Admiral Taylor to read it as "The technique should be used as the last resort."

Admiral TAYLOR. That was poor reading on my part. I did not realize I had said it. The statement reads:

It should not be restricted to use as a last resort.

Mr. KASS. What page is that on?

Admiral TAYLOR. Page 2 of the formal statement. In paragraph 2, the second line, the sentence begins:

It should not be restricted * * *

I thought I felt Mr. Barron cringe at one place in the discussion. That must have been it.

Mr. Moss. We have corrected it. It is, of course, correct in your copy.

Admiral TAYLOR. Thank you, sir.

Mr. BARRON. May I proceed, sir? Having the benefit of the previous testimony, we were surprised, at least in our opinion, that a considerable mystique has been built up about this technique. We feel strongly there is no mystique.

It is a very simple matter, no matter what fancy names we give it. It has been long reliably established by laboratory work and you can prove this to yourself from your own experience, that physiological reactions will accompany emotion.

Think of the last time you felt extremely happy, resentful, joyful. You recall the last time you had a narrow escape, you could not control the trembling of the extremities, the heart was pounding.

This is a very simple thing. It accompanies emotion. This is the theory of the polygraph. Since it is established that there will be a physiological response to the emotion, if you can chart the individual's physiological pattern, while he is answering a list of question to which you know the truthful answer and you ask him a question to which you do not know the truthful answer and if the pattern varies and breaks consistently and repeatedly at that point there has to be an explanation for it.

We do not say that the explanation necessarily is deception. We do feel strongly that an emotion has been aroused by that particular stimulus. It might be anger. It might be resentment. But all we

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ask when we do get this reaction is for the subject to explain why repeatedly this reaction would happen at that point. We do investigate prior to polygraph use, prior to interrogation, and we do so afterward. It would depend on the circumstances.

We don't call in Tom, Dick, and Harry to polygraph. Before a man goes into our interrogation room, there is well-founded reason for him to be a suspect in the particular case we are investigating.

Mr. Moss. Mr. Reuss, do you wish to start your questions now or do you wish counsel to start?

Mr. REUSS. Why don't I ask a few questions now?

Mr. Moss. Please go right ahead.

Mr. REUSS. Admiral Taylor, on the first page of your testimony you said the following, and I will read it:

> The machine will be ineffective with certain individuals for either physical or mental reasons. Included in this group will be mental deficients, alcohol or narcotic addicts while under the influence, many hardened criminals, psychological liars, et cetera.

While I thoroughly agree that alcohol or narcotic addicts while under the influence would be inaccurate subjects for a polygraph examination, wouldn't alcohol or narcotics addicts while not under the influence equally, upon occasion, be improper subjects for a polygraph examination? Wouldn't the withdrawal symptoms of narcotic addicts produce bizarre results?

Admiral TAYLOR. Not being an expert in this field myself, I would hesitate to answer positively to your questions. I would think, however, that when not under the influence, the pattern for the individual could be established and the variation from that pattern might possibly be significant.

However, I would like, if I may, to ask Mr. Barron to answer that.

Mr. REUSS. Yes, please.

Mr. BARRON. My answer would be the same. During the withdrawal phase, the poor addict can't sit still anyhow. You could never test such a man. Negatively speaking, he is still under the influence. He needs a jolt. We would not try to test him.

You take a real wino and you can spot them. I am not talking now or I am not talking about the man who drinks wine every day. We wouldn't try to test him either.

Mr. REUSS. You then go on in your statement, Admiral Taylor, to exclude pathological liars from the group who may usefully be tested. I take it your reason for excluding them is because they are tough guys, they can lie and their emotions don't bother them as they would that of a normal person.

Admiral TAYLOR. In part, sir, but I must say that piece of wording was put in this statement by me and not by my experts on the grounds that the machine, as I understand it, won't react in a different pattern to a fellow who thinks that what he is saying is correct and has no apprehension about the results of his statement.

Mr. REUSS. In the light of this, doesn't this make the machine a rather circular operation and relatively useless, if the purpose is to detect a bold liar, and if a bold liar is impervious to detection by the machine. Don't we engage in a rather unproductive exercise?

Admiral TAYLOR. Yes, sir. Except that we are not trying to detect a liar. What we are trying to do is detect a difference in reaction

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to permit us to pursue a new course of investigation. One of the reasons for the use of the term "75 percent" in this statement is that some 20 percent or so—and these are guess figures based largely on an empirical evaluation of experience—some 20 percent or so give indeterminate results.

I would say that perhaps the psychological liar would show an indeterminate result. What would you say?

Mr. REUSS. Getting back to the 75-percent figure, I think you referred to the earlier 1951 article by naval intelligence sources. Looking at that article I find the assertion there "that 75 percent represents a reasonably high percentage of cases in which examination on the machine produces definite and positive results. (See exhibit 11, p. 273.)

What is the basis for this assertion that the machine is 75 percent correct? I don't find the foundation for that statement set forth either in your testimony or in the article.

Admiral TAYLOR. The foundation is not set forth, sir.

Mr. REUSS. Where did ONI get that?

Admiral TAYLOR. This was based upon the number of cases in which a positive or negative result was obtained and later evidence corroborated and verified the result.

Mr. REUSS. How many cases, by whom, and when?

Admiral TAYLOR. I can't give you that statistic, offhand, sir.

Mr. REUSS. Would you file with the subcommittee at this point a complete analysis of that 75-percent assertion? How many cases were subjected to polygraph, over what period, under whose auspices, and the results of the followthrough on those cases, so that the validity of the 75-percent assertion can be checked.

Earlier in this hearing one assertion was made that the polygraph was about 99 percent effective, or 95 percent effective. But on analysis and cross examination it turned out that this test of efficacy had been conducted by the people who actually made the test themselves.

Secondly, the true percentage appeared from the actual followthrough on the cases to be something like 18.9 percent, rather than 95 percent. So if you can submit those figures to us, it would be helpful.

In your answer to our questionnaire, for example, it was said by Naval Intelligence: "An accuracy rate of 75 percent is considered the optimum." In other words, will you give us the basis on which that statement was made?

Admiral TAYLOR. We will attempt to do so, sir. For your information, the author of that article is Mr. Barron.

Mr. REUSS. Let Mr. Barron state it right now.

Mr. BARRON. Let me expand on that answer. In 1951, at the time Korea was coming on, we were faced with a situation in the Pentagon where there were two factions. One wanted to use this polygraph to clear aliens. We didn't think that the machine was responsible enough for that work, to grant a security clearance to aliens. We were bringing in a lot of aero technicians. We didn't want to buy it.

We took the limited number of cases we had at that time. Mr. Mulligan, who is now deceased and wrote the article, tested them. We looked them over and in about 25 percent of these cases, it could have been due to the operator, you understand, there was no discernible reaction and no pattern could be discerned on which you could base an opinion.

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On the other 75 percent we felt a conclusion could be drawn, either that there was a reaction or that there was not a reaction there. These were the grounds on which we based our protest, that 25 percent is too big a gap to allow on security.

The accuracy figure in that book does not refer to the same thing at all. Our experience, testing out what we have found in the polygraph, against objective investigative evidence, has shown that we attain at least an accuracy of 80 percent.

We will glad submit as many investigations of criminal reports, plus the polygraphs that were connected with them as you will need to see that figure is a bona fide one.

Mr. REUSS. I hope you will, but what you have just said doesn't lead to confidence on my part that your figures will substantiate that. Because what you have just said, if I heard correctly, was that this figure of 70 percent accuracy put in there by the author of that article, now deceased, merely said that in 30 out of 100 cases the polygraph doesn't tell anything either way.

Mr. BARRON. That is not exactly it. Take 100 people. Out of that 100 people you will find from 2 to 5 percent who for physical or mental reasons are not suitable for testing.

Mr. REUSS. You don't give them a test at that time?

Mr. BARRON. That is right.

Mr. REUSS. Then let us start with the new 100.

Mr. BARRON. Trim it down to 70.

Mr. REUSS. Trim it down to the 100 actually given the tests. Leave the winos and narcotic addicts to one side. You give 100 people a test.

Mr. BARRON. If I give 100 people a test, if our study made in 1951 was worth anything, at least 30 should be indeterminate results either prior to testing or either after the test started were disqualified as not suitable subject for testing.

Mr. REUSS. What happened to the remaining 70?

Mr. BARRON. One way or the other, their charts gave us something on which we could arrive at an opinion, either that there was reaction present or that there was not reaction present.

Mr. RUESS. The 100 percent we are dealing with incidentally applies to 70. Let us keep numbers and percentages apart. We have thrown out 30.

Mr. BARRON. Yes.

Mr. REUSS. This exercise is a little confusing because you started with 100 people.

Mr. BARRON. And we threw out 30.

Mr. REUSS. So we are dealing with 70 people. You gave each of the 70 a test?

Mr. BARON. Yes.

Mr. REUSS. Of those 70, what percentage were positive, for example, showing deception, and what percentage were negative, for example, showing no deception?

Mr. BARRON. Those are your terms, Congressman, not mine.

Mr. REUSS. Tell me what your results indicate.

Mr. BARRON. Of these 70 that we tested the results, whether there was a reaction there that led to further interrogation and investigation or whether there was not, we arrived at an 80-percent accuracy figure by checking the polygraph operator's work against independent objective investigative results.

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Admiral TAYLOR. I think the point of Mr. Reuss' statement is, eliminating the general error category and the indeterminate what is our percent of accuracy and how does it compare and what statistics we have to support it. Is that correct, sir?

Mr. REUSS. Yes, sir.

Admiral TAYLOR. We will try to furnish you some statistics on that. (See exhibits 14A and 14B, pp. 279–281.)

Mr. REUSS. I will read them with interest, but before I leave it now, do I gather, then, that of the 70 people tested, 80 percent of those showed a reaction which led you to believe that they were lying about some of the answers?

Mr. BARRON. No, sir.

Mr. REUSS. Will you state it again?

Mr. BARRON. Eighty percent of the results or 80 percent of these 70 people we tested, we arrived at a conclusion about, either that they were reacted which justified further investigation of this man as the prime subject, or there were not reactions. Eighty percent of them by independent investigation, using other investigative techniques, we found that the findings of these other techniques jibed with the findings that we arrived at on the polygraph.

Admiral TAYLOR. I think the point we are trying to make is that we don't try to make a statistical analysis, or even a judgment, that deception has been practiced but rather that there is evidence there of a reaction which raises doubts whether we have arrived at the truth and requires further investigation.

We don't regard the machine and the operator and his reading as a positive indication in any way shape or form of deception, but rather of something that is worthy of further investigation—a difference in reaction.

Mr. REUSS. Let us follow our little exercise here. You started with 100 people. Thirty were winos, narcotic addicts or sick people, so you didn't test them at all. That leaves 70.

Mr. BARRON. Even those who had a valid scruple against taking it.

Mr. REUSS. Yes. So our base figure is 70. Of that 70, 80 percent led to a productive result, and 20 percent to an indeterminate result so you pursued the matter no further so far as the polygraph is concerned. Eighty percent of seventy is fifty-six. So let us start with these 56 people.

Of those 56, how many of that 56 showed—I don't want to say a guilty reaction—a reaction which led you people to believe where there is smoke there is fire and you better pursue this a bit. How many of the 56 came through without a squiggle in the polygraph line and led you to say that this is a good honest man and innocent as the driven snow and hence we are not going to pursue him any further?

How did you divide up the 56?

Mr. BARRON. I don't know.

Admiral TAYLOR. We would have to explore and find out. (See exhibits 14A and 14B, pp. 279–281.)

Mr. REUSS. If you don't know, I don't see how you can tell the world and this subcommittee that the polygraph is worth anything. For all I know, the people whom the polygraph fingered were the innocent ones and the people whom the polygraph cleared were the guilty ones.

Mr. BARRON. That is the conception of our use of the machine. I

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thought I made that clear. We have 56 people we tested validly. Some ran clear. I don't know. I am an investigator and not a statistician, I tell the investigators this man looks like he is eliminated. We will have to look someplace else for the culprit.

We go out and find the culprit. This man shows reaction which indicates that maybe he knows more about this offense we are investigating and we pursue it. We look for witnesses who might logically have seen him. We look for the motivational factor for performing this crime.

Mr. REUSS. You are being responsive, I might say, to my question and I appreciate it. I hope the material you will file with us will show that the polygraph was on target, that the ones whom the polygraph flagged to you as being eligible for further investigation were in fact investigated, and that they were found guilty of the substantive offense with which they were charged.

Conversely, those whom the polygraph cleared were at least to the maximum possible extent found to be correctly cleared, because somebody else was found to be the guilty person. If you will file that material in a form which will be intelligible to members of this committee, that will be most helpful, even though the sample of 70 is a very small one.

Mr. BARRON. Let me ask you this, sir. Do you want us to get every case in which we used the polygraph or what number of cases would satisfy you?

Mr. REUSS. I want to make it very easy. I want to have the information on which this assertion which has governed the Navy policy for the last 10 years was based. Granted it is small, but let us start with that, because this material was used in this article and would be available.

Mr. MOSS. The Chair would like to observe that in order for such a submission to have any validity at all, it would have to be a random sampling, it could not be a selection of those cases in which results of one form or another were obtained. If we are going to take this sample of the subjects you have tested, then it must, in fact, be a random sampling or it has no validity.

Admiral TAYLOR. Mr. Chairman, we will certainly have to dive into our files to do this. This is one of the reasons I responded a moment ago that we don't know. We don't normally run statistical analyses of this sort. We are capable of doing it and we will seek a random sample that either supports or refutes this statement of ours.

Mr. REUSS. My point was that here the Navy is using a program which costs three-fourths of a million dollars a year and may have some effects on personnel which are unfortunate, and we want to be sure that the service's fundamental reason for using this device in the first place is one that has a thorough foundation.

Mr. BARRON. Sir, may I ask you a question?

Mr. REUSS. Yes.

Mr. BARRON. That three-quarters of a million dollar figure you just looked at, is that the salary figure?

Mr. REUSS. Yes.

Mr. BARRON. We made it quite plain that these men are primarily investigators. The use of the polygraph is just an additional skill they have. They are not doing just polygraph work. They are competent all-around investigators.

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Mr. REUSS. The polygraphs apparently cost ONI $62,525.

Mr. BARRON. Yes, sir, that is the cost of the machines. I think the other figure you gave was the salary figure.

Mr. REUSS. That is right, that is the annual salary. As you say they do other work.

Mr. BARRON. The majority of their work is other work.

Admiral TAYLOR. If it is of interest to the committee, I think this point is well taken, if I may pursue it.

Mr. REUSS. Surely.

Admiral TAYLOR. That is that the qualification as a polygraph operator is an adjunct and an additional qualification of our regular investigators for those who can meet the standards that we prescribe for such qualification. So an individual who is listed as a qualified polygraph operator does not do only that.

This is by no means all of his job, as you will see from the statistics that you have there. We are rather circumspect in using the device and use it, I think, quite sparingly. So, for some 600 or so investigators we may have, of which 80-some-odd would be qualified as polygraph operators, we might run a total of 1,000 to 1,200 examinations a year and those people are out on the street doing other investigations when they are not conducting a polygraph test.

Mr. REUSS. Let me ask about another matter contained on page 4 of your testimony, Admiral Taylor. You there referred to the fact that you don't combine different categories of offenses and as an example you give a suspect being tested for both unauthorized disclosure of classified material and for sexual deviation.

Then you say in the example indicated, even though the compromise is the more serious offense, the subject himself is apt to be more concerned about the sexual problem. Accordingly this issue should be handled first in effect to sanitize the subject so that concern about the sexual issue on the subject's part does not distort or becloud the questions concerning the compromise. By handled first, you mean earlier in the questioning?

Admiral TAYLOR. With a separate examination, sir. With one examination pointed with questions germane solely to the issue of the sexual problem and quite separate and distinct examination with separate questions pointed toward the matter of compromise.

Mr. REUSS. Would those separate examinations follow one another?

Admiral TAYLOR. No, indeed.

Mr. REUSS. How much time would intervene between the two?

Admiral TAYLOR. That would be a matter of judgment of the people who conducted the examination. I would think normally there would be at least a day's rest in between or something of that sort.

Mr. REUSS. On page 3 of your testimony you refer to a waiver which must be signed by the person submitting himself to the polygraph examination.

Admiral TAYLOR. Yes, sir.

Mr. REUSS. Do you have a copy of that waiver form?

Admiral TAYLOR. Yes, sir; one was submitted, I believe, to the committee.

Mr. REUSS. While we are trying to find the waiver form, am I right in my information that in Navy polygraph tests, there is in the polygraph room a two-way mirror which permits a person to observe the

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polygraph subject without the subject's knowing he is being observed?

Admiral TAYLOR. That is correct.

Mr. REUSS. Is there also a concealed microphone of which he is not aware?

Admiral TAYLOR. As a rule. He may be made aware of it. If he inquires, he is told. We don't volunteer the information.

Mr. REUSS. Are his statements recorded by a recording device?

Admiral TAYLOR. The statements of both the operator and the subject are recorded.

Mr. REUSS. Is this information that his statement is being recorded volunteered to the person who is taking the test?

Admiral TAYLOR. Not necessarily; no, sir. May I comment on that a moment, sir.

Mr. REUSS. Surely.

Admiral TAYLOR. This is an important factor in the protection of the subject as well as the observation of him. In cases where we feel it is necessary to give a polygraph examination, the examiner and the subject are observed and the tape is heard by supervising agents who are making a determination not so much perhaps of the subject's reaction, his facial demeanor and so on, but whether or not the operator is following our policy in conducting questions so that the statements are germane to the issue, not to use sudden hard questions that startle the subject or something of that sort.

I have witnessed some.

Mr. RUESS. The operator knows that the mirror is a two-way mirror because this is part of the regulations.

Admiral TAYLOR. He does indeed. The supervising agent will later examine not only the questions that were asked but also the sound tape that was taken when the examination was conducted to assure that the polygraph operator was indeed following proper policy.

Mr. RUESS. The waiver form which I now have in front of me says:

I—
with a space for his name—
have been informed of my rights and do freely and voluntarily submit myself to examination by polygraph—
lie detector.

I have been told that I do not have to submit to such an examination unless I wish to do so.

I further agree to cooperate voluntarily and fully with the operator of the machine during this examination.

That waiver form doesn't say anything about concealed observers behind two-way mirrors or concealed microphones.

Admiral TAYLOR. No, it does not.

Mr. RUESS. Particularly in light of your statement that the two-way mirror device and the concealed microphone are really for the protection of the person giving the polygraph test—for the surveillance of the operator rather than of the person submitting to the polygraph test—wouldn't it be a good idea in the interest of fairplay to inform the subject before he is asked to take the test that he will be subject to surveillance and to recording that he can't observe?

Admiral TAYLOR. We have no objection to informing him at all.

Mr. REUSS. But do you inform him unless he asks?

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Admiral TAYLOR. Unless he asks, we don't.

Mr. REUSS. Wouldn't it be a good idea to inform him?

Admiral TAYLOR. I don't really know, Mr. Reuss, whether it would be. Not being a trained interrogator I would like to ask Mr. Barron's opinion whether or not he thinks it would be a good idea.

Mr. BARRON. I have at times volunteered that information to him in the interest of my own safety when I had a yegg in there. We don't search them before they come in. For all I know, this character has a switch-knife on him and if I think he is capable of violence, I make sure he knows he is being watched.

But as a general policy, no.

Mr. REUSS. That is for your protection?

Mr. BARRON. Yes, sir.

Mr. REUSS. What about the 18-year-old kid who has been in the Navy for a few months and is suspected of pinching something from the warehouse? After all, the Navy gives him lengthy indoctrination and educational courses in American institutions and civil liberties, and so on.

Mr. BARRON. Yes, sir.

Mr. REUSS. Wouldn't it be a good idea to tell these subjects that the mirror is not really a mirror, but a surveillance device?

Mr. BARRON. You have answered the question. He is an American citizen and knows he has the right to counsel. If he says he wants counsel, we say there is the door, son. There is no effort to argue him out of it. We don't volunteer that he is entitled to counsel. He is an American citizen. He should know.

Mr. REUSS. I would comment that I think the day will never come when the American citizens, as an incident of their citizenship, have to be aware of the fact that the room is bugged and the mirror is a device to enable "Big Brother" to see them when he can't see through the mirror.

I will yield to the gentlemen.

Mr. REID. I just wanted to ask Admiral Taylor one question in connection with the interrogation by Mr. Reuss. If the individual fills out the waiver and he elects not to take a polygraph test, is this considered adversely, and is it included in the man's record one way or the other?

Admiral TAYLOR. It is included in his investigative record. It is not included in his personnel record. Where all other things are equal, there is no other evidence one way or the other, the failure of a subject to accede to a polygraph examination, even though he may have signed a waiver and then changed his mind at the last minute—at whatever point in time he may change his mind—will certainly raise a measure of doubt in review of the case.

But where there is no other evidence, all doubts on that score are resolved in favor of the individual. I have several cases of that sort come to my personal attention here recently.

Mr. REID. Is it not conceivable that the individual, because of reasons of his own or in pursuance of what he considers his constitutional rights, might as a matter of principle, in some instance at least, just elect not to take a polygraph.

Admiral TAYLOR. Yes, sir.

Mr. REID. Indeed, any conclusion one way or the other as to why he did not elect to take it would, perhaps, not be germane.

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Admiral TAYLOR. Yes, sir. Sometimes the fellow himself doesn't know the motive that impels him to decline, even though all evidence may point to the fact that he is innocent. You have a conflicting situation where an accusation is made and you run and investigate and check everything out and you say, well, the only thing we can do is confront this fellow with his accuser, let the accuser take a polygraph examination and let him take a polygraph examination, and see if there is some other avenue of approach we can take in this case.

Even in those cases where the evidence may point toward the complete innocence of the accused, and he may refuse even after being told that it might be to his benefit to take the exam, my feeling is, and I have ruled on a number of these cases, he doesn't know himself why he doesn't want to take it and that is discounted in consideration of the case.

There has to be other evidence.

Mr. REID. Thank you.

Admiral TAYLOR. That is, in order for it to have an adverse effect.

Mr. Moss. However, in response to the questionnaire from the subcommittee, the Navy made this statement:

> Weight given to the data and to the refusal to submit to the investigation can only be assayed in light of the particular investigation. It is safe to say that this Office will realize that some subjects refuse to submit to an examination on the basis of moral scruples which they consider valid. In other cases, a refusal may be considered a tacit admission of guilt.

Admiral TAYLOR. There has to be other supporting evidence, Mr. Chairman.

Mr. Moss. In neither case would such a refusal itself be considered as grounds for personnel or disciplinary action. But there is clearly the implication here that the refusal could be prejudicial.

Admiral TAYLOR. That implication is certainly there.

Mr. Moss. Do you think that is a proper implication to convey to the subject where there is supposed to be a completely voluntary determination as to wether or not he will submit to a polygraph examination?

Admiral TAYLOR. This statement, Mr. Chairman, is made from an investigative point of view and not an adjudication point of view. In adjudication of a case where a determination has to be made as to whether or not the evidence points toward the guilt or innocence of an accused, that would have to be disregarded.

But people being what they are, I think that we would be bound in all honesty to admit that where other evidence points toward the individual who has refused to take an exam as being implicated in the case, you would certainly have personal doubts. I would.

Mr. Moss. Of course, Admiral, I have since April of last year been directing a staff study of polygraphs. We have been attempting to get together a great deal of information so that we would be in a position to understand the full subject and prepare for these hearings.

I started this assignment with no definite opinion on polygraphs. I had never given them much thought, but as a result of the experience of the past 12 months I would refuse most emphatically to take one, unless perhaps I had my personal physician, a psychiatrist, and my lawyer with me and had their evaluation of what was going on.

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Admiral TAYLOR. I really can hardly blame you for taking that view, particularly in view of some of the things I have heard in sitting in this hearing on the sidelines. May I speak quite freely, sir?

Mr. Moss. Certainly you may.

Admiral TAYLOR. I have misgivings about this thing, too. What I feel to be a lot of pseudo-scientific nonsense that has been discussed here. It is the avoidance of this pseudo-scientific nonsense that we have tried to pursue in our use of the device.

We don't attempt ever at any time to try to interpret a variation in pattern on the graph as an emotional reaction indicating guilt. But rather, as Mr. Barron said earlier, one which is different from the reaction that takes place when we know the individual is telling the truth.

This causes us then to feel we must investigate further. To that extent, sir, I think the device is extremely useful. You have not asked me these questions yet, but I feel sure you will. It is for that reason that we don't go into these long courses in psychology and physiology and so on, where the subjects, each one are full studies themselves, and it is pretty difficult to achieve a degree of competence that would really qualify the individual in those fields and to apply that to a mechanical device such as a polygraph.

That is why we try to stay away from that angle entirely.

Mr. Moss. A stethoscope under those conditions, might have equal value.

Admiral TAYLOR. It might, sir, but it is not as handy.

Mr. BARRON. A stethoscope would not give you a continuous record that would be available for review.

Mr. Moss. It would depend on the alertness of the person using it.

Admiral TAYLOR. You are quite right.

Mr. Moss. The stethoscope amplifies a sound that is continuous.

Mr. BARRON. Yes, sir. But it does not make a record of it.

Mr. Moss. It does not make a record of it. I suppose you could get recording stethoscopes.

Mr. BARRON. I suppose so.

Admiral TAYLOR. Mr. Chairman, I fully share your views and we feel that this is a mighty helpful examination of the whole topic. This is the view of the Department of the Navy, I am sure. That this examination is healthful and helpful.

Mr. Moss. That, of course, is the objective of the subcommittee, to be helpful and to be constructive in making an inquiry of this sort.

Admiral TAYLOR. I have advised people myself on the question of polygraph. I have said, "If you feel you are in good health, and you have absolutely no connection whatsoever with these allegations, you have little to lose in taking the examination."

But if you want my considered opinion as someone advising you to what your rights and where your best interests lie, I would say don't take a polygraph examination. I feel just as you do about it.

Mr. Moss. Thank you. I am sorry to have interrupted your line of questioning.

Mr. REID. Admiral Taylor, I would first like to ask you what the criteria are for the training of polygraph operators. I note in the material that you submitted to the subcommittee that the Navy requires a college degree. You state the training program is an internal course of 5 to 8 days.

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Admiral TAYLOR. That is a correct statement. We train people who have shown a minimum of 18 months of outstanding performance as an interrogator. I differentiate between interrogator and investigator here. They may well have been employed by us as investigators and not have been permitted to do any interrogation.

But 18 months' minimum as an interrogator, showing real competence in the field. Because of our philosophy of use of the device, which is simply to determine whether there is a deviation which requires further investigation, we concentrate on the investigative background and maturity and judgment of the individual and confine the training course to the technique of using the machine and the basic requirements for reading the graph.

We reckon that in that period of time with the small groups we have, they become sufficiently competent to be able to determine the differences that are quite apparent as you could see in the slides that were shown.

Mr. REID. Admiral Taylor, in the testimony that the subcommittee too yesterday, there were some witnesses that indicated there should be a minimum of 6 months training. There were some inferences on top of that that because of the high degree of variables in the amount of medical knowledge one might need to interpret pulse, respiration, blood pressure, and galvanic skin response, that perhaps 6 months might not be enough.

Perhaps it would almost require a medical degree. I don't know what length of time is necessary, but I would be rather surprised if one could adequately train an individual in 6 days.

Admiral TAYLOR. We think we can train him to read the deviations that occur. Subsequent to this, he consults with experienced interrogators and operators in the use of the device, he is supervised in the use of it.

The questions that he asks are reviewed. The conditions under which he gives the examination are carefully reviewed by the supervising agents in each of our districts, and he develops experience, and better and better and fuller knowledge of when he has something worth pursuing further and when he has not.

I think, sir, in the context of the discussions on length of time necessary to train an operator, one has to go back to the basic purpose for which the device is going to be used. If it is going to be used as a screening device, which we deplore and don't use—although that is a general policy and we have deviated from it—if it is going to be used as a screening device, I would say some rather long and careful preparation certainly is in order.

Mr. REID. How long do you think it would require to train someone to interpret an electrocardiogram?

Admiral TAYLOR. I have no idea, sir. I don't know what the length of time is. I think from what I have heard—I have had them taken—it takes a medical officer who not only knows the function of the heart and vascular system, but a fellow who knows that device and its vagaries. I don't know how much time it would take.

Mr. REID. Do you think a polygraph is simpler than an electrocardiogram to interpret properly?

Admiral TAYLOR. For the puropose we have in mind, yes, sir.

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Mr. REID. But if I understood the line of interrogation by Mr. Reuss a minute ago, you indicated that out of a sample of something like 100, something like 56 of these cases would be brought before a polygraph testing procedure. I gather that while this is part of the investigative procedure, nonetheless it is not totally unimportant.

Therefore, we are saying that out of a total of 100 cases in the Navy, you are placing some reliance—and perhaps substantial reliance—on a device, and the interpretation thereof is done by officers with some 6 days training.

Admiral TAYLOR. I think the case was really the 56 that we finally got out of our mathematics of those cases which actually went to the polygraph and which actually showed a positive or negative reaction.

Mr. REID. What I am suggesting is that if, out of the 100 you learn from the operator that some 56 cases have shown some kind of reaction you would want very high professional standards to evaluate that reaction.

Admiral TAYLOR. You yourself, sir, looking at the charts can see a deviation.

Mr. REID. I must allow that I don't believe I could from what little I have seen of it. It seems to me a rather complicated matter where a high degree of professionalism is required.

Mr. Barron, I have just one or two questions I would like to direct to you. You said earlier that a physiological reaction accompanies emotion. Your phrase was that this is a very simple thing. Do you indeed believe that the relationship there is very simple?

Mr. BARRON. The relationship between the body and the mental?

Mr. REID. Between emotion and physiological reaction. You said you believe it is a very simple thing.

Mr. BARRON. I am not a medical expert or a doctor. It does happen. Like Galileo it still goes around. That deviation shows up. Why they show up I do not know.

Mr. REID. You said further it has been established there will be a response.

Mr. BARRON. Yes, sir.

Mr. REID. I believe we have had some testimony that indicates that sometimes there is not a response and for a variety of reasons they would not attempt to speculate.

Mr. BARRON. It would not be detected with the sensors that we commonly use. We have no sensor that would determine dryness of throat which I am sure you gentlemen have felt when you had a narrow escape. We have no sensor that measures the brain wave.

We have no sensor that measures skin temperature at the extremities or any other part of the body. Yet perhaps this is where the physiological change appears. We do not say that we are tapping every part of the body.

Mr. REID. Would you care to amend your statement that "it has been established there will be a response," to "it has been established that sometimes there is a response"?

Mr. BARRON. There will be a response. No, sir. I am taking this on the authority of the psychologists. There has been constant work in this in laboratories since 1870. I accept that on faith.

Mr. REID. My impression is that there is some disagreement whether there will be a measurable or interpretable response.

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Mr. BARRON. There I agree with you.

Mr. REID. Another statement, Mr. Barron, was that you don't call in every Tom, Dick, and Harry; you have a well-founded reason when we do call someone in.

Mr. BARRON. Yes, sir.

Mr. REID. Would you tell us why you call in someone and what you consider a well-founded reason?

Mr. BARRON. Sure. We have a complaint. Somebody put sugar in a generator. Through inquiry aboard ship we isolate those people as in any criminal investigation as logical suspects. Through a further interview we come up with the people who either have shown a capability for doing it or a motivation for doing it.

We will interrogate those people. It may be necessary to ask them to submit to polygraph examination.

Mr. REID. Because someone has taken a little extra sugar on shipboard for coffee rationing you put him through the polygraph?

Mr. BARRON. No, I said put the sugar in a generator which ties up the ship for 3 days.

Mr. REID. Do you have a polygraph on each ship?

Mr. BARRON. No, sir.

Mr. REID. They are not on board ships?

Mr. BARRON. No, sir. We have gone aboard ships and conducted cases aboard them.

Mr. REID. You would only examine someone when there is serious cause.

Mr. BARRON. With one exception, sir. In criminal investigations, time is of the essence. If we have a large number of suspects, a sum of money has disappeared, there are 30 people, preliminary inquiry has shown, who had access to that money or who are suspects because of circumstances, time, or location. We might there employ the polygraph right at the beginning.

Not to find the guilty person, but to eliminate those people to the best of our ability, using the technique so that we could concentrate our investigative efforts on the few remaining who show the deviation when we ask them questions about the missing money.

Mr. REID. Was I correct in hearing that you said the word "eliminate"?

Mr. BARRON. Yes, sir.

Mr. REID. You would not pursue the investigation of others.

Mr. BARRON. We have 30. We could eliminate 25 and remain with only 5 logical suspects. Our task is much faster and immeasurably easier.

Mr. REID. Assuming the five don't check out.

Mr. BARRON. We have to start all over again.

Mr. REID. I was just interested in how you could say quite so precisely that you could eliminate a certain number. It seems to me the testimony before the subcommittee suggests that sometimes you cannot.

Mr. BARRON. I will amend the statement, Mr. Reid. That has been my experience. If all 30 showed deviation, we would have to check out all 30. As to the incident I mentioned we use it as a timesaver.

Mr. REID. How many polygraphs do you have in the Navy now?

Mr. BARRON. I will have to check the figure now. I don't know right offhand.

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Admiral TAYLOR. Fifty-some, I believe.

Mr. BARRON. It is in the answer.

Mr. REID. That is still the current figure, 77?

Mr. BARRON. We have 15 new machines, so the number remains the same.

Mr. REID. You have 86 operators. Admiral Taylor, do you have any kind of review procedure that would protect an individual's rights in an investigation of this character? That is to say, a review of the meaning of the polygraph traces, or it might be a review to deal with an individual's refusal to sign a waiver.

At any rate, some kind of high-level review to satisfy yourself that the conclusions at least as they pertain to the polygraph, the taking of it or not taking of it, are not treated in a routine fashion—to do everything possible to accord the individual the rights of due process insofar as that is possible, consistent with that individual's responsibilities to the Nation.

Admiral TAYLOR. Yes; we do. In each naval district we have an organization set up with a captain in charge and the commander is the executive officer and two senior civilian assistants, one who is called security analyst—three senior assistants—an intelligence analyst, and a supervising agent.

The supervising agent reviews all cases of any kind conducted by the agents in the district, whether they be background investigations, whether it be a criminal investigation, whether they be subversion, sabotage, or espionage.

On each one of these he reviews the case for proper conduct and protection of the rights of the individuals involved. If there is any doubt whatsoever in his mind he refers it to the security analyst and district intelligence officer.

In a serious matter it would be referred to me here in Washington.

Mr. REID. Could you tell the subcommittee what training the security analyst gets in terms of the polygraph?

Admiral TAYLOR. He is apt to not have any, so far as the polygraph is concerned. He is in a different area of endeavor.

Mr. REID. So we get back to the fact that the actual polygraph operator in the Navy has 6 to 8 days' training in the use of the polygraph although he has had perhaps a year and a half of investigative experience.

Admiral TAYLOR. This is a minimum situation. The actual situation is, we are in much better shape than that. The average age of our polygraph operators is somewhere around 40.5. They are all trained and experienced agents. Most of our supervising agents are also polygraph operators. They have had years of experience at it, as has Mr. Barron. That is one of the reasons I brought him in. He is the only one authorized in the naval intelligence organization to train polygraph operators. He is a graduate of Keeler School, as I mentioned earlier.

Mr. REID. Have you ever had a board appointed to evaluate the usefulness of the polygraph—a board that would include the several disciplines of medicine, psychiatry—and consider the kind of questions that a psychologist might feel would elicit a voluntary or involuntary response?

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Have you contacted any of the disciplines in the use of this technique?

Admiral TAYLOR. Not to my knowledge. (To Mr. Barron:) Do you know of any?

Mr. BARRON. No, sir.

Admiral TAYLOR. Not to my knowledge.

Mr. REID. Do you, yourself, have confidence that the training is sufficient in terms of professional knowledge in the several disciplines?

Admiral TAYLOR. I have full confidence that our trained operators are quite competent; yes, sir.

Mr. REID. That is a little bit of a different question, I believe. What I was talking to is the new operator who you are training, not the man who may have had years of experience in its use.

Presumbably, you train a certain number of new operators each year. Do you have confidence, therefore, that those individuals with what appears to be rather minimum length of time in training, that their training is adequate?

Admiral TAYLOR. Yes, sir; I do.

Mr. REID. You would discount the testimony of some others, that it is extremely complex and that it perhaps takes 6 months to understand it, and even then you might usefully have a medical degree.

Admiral TAYLOR. Yes.

Mr. REID. What we are trying to determine is whether we really have professional standards here.

Admiral TAYLOR. I do indeed, Mr. Reid. But again, I must qualify my confidence on the grounds or within the parameters of the purposes for which we use the device.

Mr. REID. If you stick entirely to the parameters and I gather you treat this as incidental in part, but perhaps sufficient to type something one way or another given other factors, if that be a fair statement of it, that it is a guide, and perhaps a pertinent guide, and perhaps even eleminate certain other people from consideration, using Mr. Barron's phrase, then it becomes something a little more than incidental when it perhaps invades an individual's right of privacy and certainty affects his rights and whole future in the service.

It is one thing, it seems to me, when we have really professional people giving these tests for really clear reasons, but it is perhaps another to have untrained men give these tests.

Admiral TAYLOR. In answer to your question, I consider, Mr. Reid, the competence of the individual and his proven experience as an interrogator and his proven reliability as an employee under our system, the degree of training that we give him is adequate to assure against misuse of the device.

Mr. REID. Are you aware, Admiral Taylor, of the study that was made in the Atomic Energy Commission about 1952?

Admiral TAYLOR. No, sir; I am not.

Mr. REID. This was a panel study which has recently been declassified, as a result of which the Atomic Energy Commission decided not to use the polygraph, except in a few instances where there was clear indication of high security involved and then only on the approval, I believe, of the Administrator.

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But the study itself suggested that the advantages of the use of the polygraph as part of the overall investigative machinery tended to be weighted more on the negative side than on the positive.

Accordingly, they discontinued it because they seemed to have had from this panel of experts some serious reason for rejecting its continued use.

Admiral TAYLOR. I am not familiar with the study.

Mr. Moss. Mr. Reid, I would like to place that study in this record. I think it very pertinent to the matter under discussion. Without objection it will be made part of the record. (See exhibits 5A and 5B, pt. 1, pp. 166–183.)

Mr. REID. Let me read you just two sentences from that report, if I may:

> In weighing the advantages which might accrue to the AEC security program by the use of lie detector techniques on a commissionwide basis, it was obvious from experience gained that a lie detector program could be expected to result in only a marginal increase in security beyond that which was currently afforded by established AEC procedures for personal physical and document security.
>
> Against such internal and marginal increase in AEC security it was necessary to weigh not only the dollar cost of the lie detector program, but also the intangible cost in employee morale, personnel recruitment, labor and public relations.
>
> It was concluded that these costs outweighed the benefits which might accrue to the AEC security program at that time. On the basis of the foregoing, the Commission, in March 1953, approved the discontinuance of the use of the polygraph in AEC security program except in specific cases of security interests on a voluntary basis and upon specific authorization by the General Manager to assist him in the resolution of particularly difficult personnel security cases.

Admiral TAYLOR. I infer from that—I don't know if the inference is justified—that the AEC was using this or had contemplated use of it as part of a personnel security screening process.

Mr. REID. It originally was used according to this report at the inception of the Manhattan Engineer District at Oak Ridge. Subsequently it led to an evaluation by a group of panelists, and the decision of the AEC following that review was that its utility was marginal and its effect on employee morale was such that they deemed it prudent to discontinue it.

Admiral TAYLOR. It is that comment on its impact on employee morale that leads me to believe that they are talking about using it as a screening device.

Mr. Moss. I am informed by counsel, Admiral, that it was used very broadly. Screening certainly was one of the uses. I think the study indicates that it was the consensus of the panel that its greatest significance was in matters such as pilferage.

But even there the disadvantages were deemed to outweigh the advantages, and for that reason the AEC discontinued its use for any purposes.

Admiral TAYLOR. I certainly agree it is marginal if not possibly misleading for personnel security clearance purposes. I think from what I have learned of our experience that in criminal cases, espionage, subversion, and sabotage, it very definitely has its uses and it has been extremely useful to us, I feel, from what I know.

Mr. REID. In the light of the AEC study and the professional evaluation, would you think it pertinent for the Navy Department to make a fresh evaluation of the use of the polygraph and the training of poly-

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graph operators, and finally the review procedures and the effect this might have on a man's record?

Admiral TAYLOR. Yes, sir. I would like to see the final outcome and report of this committee before undertaking that. I think this committee will have turned up a number of factors and gathered them together in one place that will make such a job a great deal easier for all of us.

Mr. REID. Thank you. Thank you, Mr. Chairman.

Mr. BARRON. Mr. Moss, in fairness to the Navy, may I expand on the admiral's answer about the review technique for a moment?

Mr. Moss. If it is the admiral's desire.

Mr. BARRON. I ask his permission.

Admiral TAYLOR. I will mention this myself, sir, if I may. In commenting on the review procedures used in the naval intelligence organization, not only does the review take place in the district intelligence offices but also at headquarters here in Washington. Mr. Barron was anxious that point not be overlooked. I think it is a good point.

Mr. REID. If I may respond to that point, I am interested in whether or not there is adequate review by someone senior of the polygraph results and indications, such as they are. Because, certainly, if you have some polygraph operators who have minimal training, a review of those results might well be very much indicated, it seems to me.

Admiral TAYLOR. Yes, that review takes place throughout the organization.

Mr. REID. By someone that has senior experience?

Admiral TAYLOR. Yes.

Mr. REID. And is, you think, professionally qualified to evaluate it?

Admiral TAYLOR. By senior civilians professionally qualified in both investigation, interrogation, and in the use of the polygraph.

Mr. REID. I am sure from what you say they are professionally qualified in terms of interrogation and investigation. What I am not quite clear on is whether you feel in fact they are professionally qualified to really evaluate polygraph results.

Admiral TAYLOR. They are professionally qualified to determine whether the questions were proper and whether the conditions were proper, and whether the injection of the polygraph at that state in the investigation was proper.

Mr. REID. To take that one step forward, I have talked to Dr. Gallup a number of times on the subject of asking questions. I think he would be one of the first to say that this is a very, very complex matter and that he has a lot to learn as to what kind of a response a given question will elicit. Some one has to have very extensive experience in this not to get a reaction that perhaps is deceptive or not the reaction you think you are getting.

Admiral TAYLOR. Very true, sir.

Mr. REID. Thank you, Mr. Chairman.

Mr. Moss. Mr. Reuss.

Mr. REUSS. I just want to congratulate Admiral Taylor on his statement and his very helpful attitude toward this subcommittee. I think you have advanced the inquiry a good deal. I would ask you this: Despite your very honestly expressed skepticism about the mystique of the polygraph, the Navy did perform in the last fiscal

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year some 1,200 tests. You have indicated that it has a certain marginal investigative function. I would agree in a certain sense. If, for example, there has been pilfering from a warehouse at Great Lakes Naval Training Station and the pilferer could be any one of a hundred recruits living in barracks A, it might be useful to say, "all right, all you fellows are under suspicion. Who is willing to take a lie detector test?"

Let us say investigative resources are somewhat limited and five fellows say they won't take a lie detector test. Three of the five turn out to be members of the American Civil Liberties Union, so you forget about them, but two have no prior record of civil libertarian impulse. I should think it would be good economy in such a case to investigate those two on a priority basis.

However, you could get that benefit out of the polygraph system if, instead of spending $62,000 for the equipment, you just had the carpenter make up a few boxes with nothing in them. Instead of training fellows for 6 to 8 days, you just have almost anybody sit there. You would get the same effect. Isn't much of the marginal utility of the polygraph the product of the mystique rather than anything having to do with histology, neurology, psychiatry, or the other occult arts?

Admiral Taylor. Mr. Reuss, without attempting to be either facetious or impudent, I would say if we did something of that sort I would think we would be guilty of coercion.

Mr. Reuss. I think you would, too. You are neither facetious nor impudent in your answer. Isn't much of the investigative benefit you get from the polygraph of the nature I have described, having nothing to do with the efficacy of the machine, but having a good deal to do with the psychological effects of being confronted by the box?

Admiral Taylor. For inducing a confession?

Mr. Reuss. For inducing a confession.

Admiral Taylor. I am sure a great deal of it does. There are certainly cheaper methods of inducing confessions.

Mr. Reuss. Not one that the Navy would care to adopt, and I am proud of you for saying that.

Admiral Taylor. Yes, sir.

Mr. Reuss. Thank you, Mr. Chairman.

Mr. Moss. Mr. Barron, what is a valid scruple?

Mr. Barron. It would depend on the individual. I am thinking of a woman in my office who refused a job with another agency because her religious beliefs would not allow her to expose herself to a polygraph. I think a valid scruple is when an individual knows, and we all have such information, that is so personal, so sacred, that it should be between only us and our God if we have one. A person feels that this machine may bring out that information. That would be a valid scruple.

Mr. Moss. Supposing a person says "I won't take it." Why? "Well I don't have to." Is that a valid scruple?

Mr. Barron. Yes, sir.

Admiral Taylor. Certainly.

Mr. Moss. What is an invalid scruple?

Mr. Barron. The individual who as a result of investigation has become suspect.

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Admiral TAYLOR. Let me answer that. I don't think there is such a thing as an invalid scruple in this case.

Mr. Moss. I asked the question, Admiral, because Mr. Barron used the term in explaining that among those who would be excluded were those having valid scruples.

Admiral TAYLOR. Yes, sir. I am sure he made that statement considering it from the standpoint of an investigator who has information that leads him to believe that the expressed or stated scruples are not really valid. This is a matter of opinion. I think that he didn't intend to convey anything beyond that. Is that right?

Mr. BARRON. That is right, sir.

Mr. Moss. I take that in context of the response contained on page 62 of the committee print:

> It is safe to say that this office realizes that some subjects refuse to submit to examination on the basis of moral scruple. In other cases a refusal may be considered a tacit admission of guilt.

I think by implication these are those instances where there is an invalid scruple.

Admiral TAYLOR. Where there is an invalid reason really, sir. If it is truly a scruple, it is valid and recognized.

Mr. Moss. We can have an interesting semantic exercise on the matter of scruple and reason.

Admiral TAYLOR. Yes, sir.

Mr. Moss. I noted that one of the courses teaches the science of semantics in a very few hours. We might benefit from that and be able to resolve the difference rather quickly.

Admiral TAYLOR. I wouldn't attempt to engage in that discussion with you, sir.

Mr. Moss. I am concerned because here is raised a question as to the validity of the contention that the submission to the polygraph is a voluntary submission.

Admiral TAYLOR. Your point is that this statement by implication indicates that it is not voluntary.

Mr. Moss. That is correct.

Admiral TAYLOR. It is not intended that way at all.

Mr. Moss. Because it implies a prejudiced view as a result of refusal. If it is truly voluntary then a man is not prejudiced by refusal.

Admiral TAYLOR. Quite right, sir. As far as I am concerned, sir, and as far as any reviewing officer reviewing a case is concerned, the refusal to take a polygraph examination cannot be considered as any evidence against him.

Mr. Moss. Mr. Barron, how would that apply to the investigator on the spot in the step-by-step processing of a case?

Mr. BARRON. Yes, sir. This was not intended to apply to the investigator. We are a service organization. We do an investigation only when directed or authorized to do so by higher naval authority. I have investigators all over the world. They investigate a criminal offense. They have to submit a report.

The report comes in, and it is not resolved and the crime is not resolved and there is no mention of the polygraph technique being introduced, they know that I am going to come back and say, "Why didn't you use the polygraph? It might have helped you." So our agent out there, to protect himself with headquarters against being

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called a bonehead, he must put in there, the subject refused, or was offered the opportunity and refused to take a polygraph examination.

We are not an action agency. We do nothing with these reports. We make no recommendations. We merely transmit them to the authority who directed, authorized, or requested the investigation. He is the man to whom this may appear as a tacit admission of guilt.

I know this because they have called me up and said, "Barron, is it a fact that he wouldn't take a polygraph and is that an indication that he is guilty?"

Mr. Moss. The fact that it is contained in response to the questionnaire—the term used is "may be considered a tacit admission of guilt"—I feel places upon me the responsibility of determining the conditions under which it becomes a tacit admission of guilt and who would so regard it.

Admiral TAYLOR. I think, sir, that it would be so construed only where there was strong circumstantial evidence pointing to the fact that his reasons for refusal were to avoid any possibility of aiding the investigation, and that this then tells our investigator he must pursue this line further. I think this is for an investigator's viewpoint and guidance largely.

Mr. Moss. It would never be in the context that it might become an added factor in making a determination that disciplinary or personnel action would be required?

Admiral TAYLOR. Certainly not, sir.

Mr. Moss. Then I think we need clarification. In the next sentence where the response continues, "In neither case, however, would such a refusal by itself be considered grounds for personnel or disciplinary action." Implicitly, then, it could, with other factors, be considered as grounds for disciplinary action.

Admiral TAYLOR. We do.

Mr. Moss. As I understand your previous response, it would not be so considered.

Admiral TAYLOR. It should not, and in my opinion, if I were adjudicating, it would not.

Mr. Moss. It would seem to be of sufficient significance that this should be made abundantly clear to those who actually engage in an investigation, whether they use this device themselves or are aware of its use by others, in cases handled by them.

Admiral TAYLOR. I think that point is very well taken, sir. And it will be done.

Mr. Moss. Now I would like to have for the record the cost of acquiring the 15 new polygraphs.

Mr. BARRON. Just a moment, sir, I will give you the exact figure. $15,500.

Mr. Moss. The Chair is going to make an announcement. On two different occasions Mr. Backster has gotten information to the Chair that there is a psychologist in the room. The Chair wants to make it again very clear to Mr. Backster that the Chair does not call witnesses from the audience. The Chair will determine, after consultation with his colleagues on the committee and after having his staff make appropriate recommendations, the witnesses required by this committee.

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He will not be forced into calling any person and he will make an independent judgment as to the witnesses required by this committee. If Mr. Backster is not here that should be very clearly communicated to him. Mr. Archibald or Mr. Matteson, will you see that it is?

Do we have any further questions? If not, Admiral, I want to thank you very much for your appearance here. The committee has no further requirement at this time, and we are most appreciative for your cooperation.

Mr. REID. I would just like to add, Admiral Taylor, that I appreciate both your testimony and your thoughtful presentation and the degree of thoughtful skepticism you showed in those areas where perhaps a little skepticism is indicated. I, too, would like to compliment you on your thoughtful testimony.

Admiral TAYLOR. Thank you very much, sir.

Thank you, Mr. Chairman.

Mr. MOSS. The next witness is Col. David Walsh, Chief, Investigative Division, OSI, of the Department of the Air Force.

Colonel Walsh, are you accompanied by Col. Labre R. Garcia?

Colonel WALSH. No, sir.

Mr. MOSS. Do you solemnly swear the testimony you are about to give this subcommittee shall be the truth, the whole truth, and nothing but the truth, so help you God?

TESTIMONY OF COL. DAVID I. WALSH, CHIEF, GENERAL INVESTIGATIONS DIVISION, OSI, AIR FORCE

Colonel WALSH. I do.

Mr. MOSS. Will you identify yourself.

Colonel WALSH. Col. David I. Walsh, Chief, General Investigations Division, Office of Special Investigations (OSI), U.S. Air Force.

Mr. MOSS. Colonel Walsh, do you have a statement?

Colonel WALSH. No, sir, I do not. Since the procedures employed by the Air Force in the utilization of the lie detector are closely parallel to the procedures followed by the Army, we do not have a prepared statement. But I would be happy to answer any questions you have.

Mr. MOSS. Thank you. Mr. Kass.

Mr. KASS. Colonel Walsh, you stated that your procedures are closely alined to those in the Department of the Army. Could you, for the record, state whether your polygraph examiners are trained by the Department of the Army?

Colonel WALSH. Yes, sir. We send all our potential polygraph examiners to the Army school at Fort Gordon.

Mr. KASS. Colonel Walsh, what are the minimum requirements for polygraph examiners within the Department of the Air Force?

Colonel WALSH. The minimum is, for age, 25 years. Education, high school graduate. A minimum of 5 years of investigative service experience.

Mr. KASS. What about the minimum grade or rank?

Colonel WALSH. Staff sergeant.

Mr. KASS. Is the Department of the Air Force aware of the minimum standards which the Department of the Army military police have for their polygraph examiners?

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Colonel WALSH. Yes; we are aware of it.

Mr. KASS. In terms of 2 years' college?

Colonel WALSH. Yes; we are aware of that.

Mr. KASS. Colonel Walsh, are you famiilar with a document called, "Studies in Lie Detection, Computer Feasibility Consideration," by Joseph F. Kubis?

Colonel WALSH. Do you have the Air Force project number?

Mr. KASS. 5534, dated June 1962.

Colonel WALSH. Yes; I am familiar with that.

Mr. KASS. Could you explain basically what this is?

Colonel WALSH. I can't give it to you in technical language, not being a technical lie detector man. But it is a study that Dr. Kubis ran to determine the feasibility of computerizing the lie detector. This is basically it.

Mr. KASS. What was his conclusion?

Colonel WALSH. One of the conclusions that I recall—if I may digress to the lie detector—is the fact that he considers from some of his tests, that the lie detector is feasible and an acceptable machine to be used in criminal interrogation.

In regard to computerizing, he did not feel that his tests were of sufficient validity to warrant making a positive statement at this time as to computerizing.

Mr. KASS. Are you aware of Dr. Kubis' qualifications?

Colonel WALSH. No; I am not.

Mr. KASS. Could you supply that?

Colonel WALSH. I will supply that. I do not know.

Mr. KASS. Is he a psychiatrist?

Colonel WALSH. I understand he is in the Psychology Department of Fordham. I assume he is a psychiatrist or psychologist.

Mr. KASS. Are you also aware of some of the conclusions that Dr. Kubis made about what he calls "beating the machine"?

Colonel WALSH. Yes; I am.

Mr. KASS. Could you, for the record, briefly describe what these methods are?

Colonel WALSH. I am speaking from memory. I think the study probably states it better than I can. I think he talks in terms of muscular contraction as one means. Another means of forming or stimulating images in the mind during the course of the test to cause reactions.

Mr. KASS. Colonel, you stated that this was an Air Force contract. What was the cost of this contract?

Colonel WALSH. I do not know. This contract was made by the Rome Air Development Center. I can get that information for you.

Mr. KASS. You will supply that for the record?

Colonel WALSH. Yes, sir.

(The information furnished follows:)

The amount of the Air Force contract with Fordham University, awarded by the Rome Air Development Center, Griffiss Air Force Base, N.Y., was a cost-reimbursable-type contract in the sum of $24,953.

Colonel WALSH. I believe that cost may be in the preliminary study.

Mr. KASS. The costs in the preliminary study orally transmitted to me by Colonel Garcia, who is presently not a witness?

Colonel WALSH. We will get it for the record.

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Mr. KASS. Colonel, are you familiar with the instrument called a polygraph?

Colonel WALSH. Yes.

Mr. KASS. Are you a polygraph examiner?

Colonel WALSH. No, I am not.

Mr. KASS. But you are familiar with it.

Colonel WALSH. Yes.

Mr. KASS. Does the Department of the Army have any instruments other than a polygraph?

Colonel WALSH. You mean the Department of the Air Force?

Mr. KASS. The Department of the Air Force. Does it maintain mongraphs or galvanometers?

Colonel WALSH. No, sir, we just have the Stoelting standard machine with three components.

Mr. MOSS. Is it your view that the qualifications set forth by the Department of the Air Force are adequate to produce a person who is competent to interpret the physiological response obtained from polygraph machines?

Colonel WALSH. Yes; I do, if I may qualify that, this interpretation, as the Army explained this morning, is not to the nature of the physiological responses as much as to the changes above the norm after the individual is balanced into the machine and into the three components. Any deviations from the norm established at the outset can be interpreted as possibly indicating reaction to a question.

Mr. KASS. The Department of the Navy, in the testimony just given, mentioned various groups of persons who should be excluded from taking such tests—mental deficients, alcohol or narcotic addicts while under the influence, many hardened criminals, pathological liars, et cetera.

Colonel WALSH. Yes, sir. I might add that basically that is my understanding of the instrument. Yes, these people should not be tested.

Mr. KASS. Who determines in the Department of the Air Force which suspects should be given the polygraph test?

Colonel WALSH. This determination is made by our commanders in the field. We have field extensions from here in Washington. They are usually commanded by full colonels or lieutenant colonels, who make the decision. The decision is not made by the polygraph man. It is not made by the agent who is conducting the investigation.

Mr. KASS. Are all examinations voluntary?

Colonel WALSH. Yes, sir.

Mr. KASS. Are they truly voluntary or is prejudice created by a refusal to take a test?

Colonel WALSH. No, sir. There is no prejudice connected with it and the individuals are so informed. It is part of our policy.

Mr. KASS. In the conduct of Air Force polygraph examinations, is the typical two-way mirror utilized?

Colonel WALSH. Not extensively. Not as a normal course. We conduct our examinations in many places. We conduct them in rooms where there is not this facility. If the facility exists, we may utilize it. However, I might give an example. We have a policy that you cannot interview a female without another female being present.

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However, we find that some women prefer to talk without another woman present and will ask this female to leave the room. We then, if we have a two-way mirror, will ask this woman to stand behind the two-way mirror. If there is no mirror, she will move to some point either in the room or outside the room where the door is ajar to watch and hear the proceedings.

This is to protect the agent from any spurious complaints by the subject woman.

Mr. KASS. Do you record all interviews?

Colonel WALSH. No, sir; we do not. It is rarely that we will record.

Mr. Moss. If you record, is the subject informed that a recording is being made?

Colonel WALSH. No, sir.

Mr. Moss. Is the subject always informed when being observed from outside the room?

Colonel WALSH. No, sir.

Mr. Moss. If it is a fact that these groups previously mentioned should be excluded from taking polygraph tests, how is the determination made that they are, in fact, persons who are mentally deficient?

Colonel WALSH. As far as the Air Force is concerned, we are not enlisting persons who are mentally deficient.

Mr. Moss. Do you only deal with Air Force personnel?

Colonel WALSH. Yes, sir.

Mr. Moss. You do not deal with civilians?

Colonel WALSH. In rare instances. This might be in terms of our alien program where aliens are attempting to enlist in the Air Force. They must meet all other qualifications. During the course of a background investigation we will run into areas where this alien may have been behind the Iron Curtain. He may have had residence, employment, schooling. We have no way of checking this out. So this phase of the investigation will be conducted by the lie detector. However, these people still must——

Mr. Moss. You then rely on the polygraph as a screening device?

Colonel WALSH. No, sir; we do not. This is only a small part of the total investigation.

Mr. Moss. Is it a significant part?

Colonel WALSH. No, sir; it is not. Because other investigation is taken into consideration, such as normal interviews of residents in the United States, schools in the United States, character references in the United States. The polygraph become a very small portion.

Mr. Moss. If you are dealing with an alien from a different cultural background, is the response pattern on a polygraph of any value whatsoever?

Colonel WALSH. We would have to understand the country that he is from and the period of time that he was in that country. It is possible that he might come from a country where we will say that petty thievery or thievery of this nature is a way of life. A response to that type of question might not elicit the same type of response that would be elicited from an American who did the same thing and in his own society knows that this stealing is wrong. In this particular case we might not get the proper response.

Mr. Moss. As a matter of fact it is true, is it not, that if there is a significant difference in cultural backgrounds between the subject

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and the interviewer, there is little probability of the results having any value?

Colonel WALSH. Yes, sir.

Mr. Moss. Even though if it registers a response?

Colonel WALSH. Yes, sir. Except in those particular cases if the difference is so wide then we probably would have a language difference in which case we would then get an interpreter, or try to get an operator, a lie detector operator, who is capable of conversing in that language.

Mr. Moss. Colonel, do you regard the polygraph as a lie detector?

Colonel WALSH. No, sir; I would regard it as a truth detector.

Mr. Moss. Would you regard it as a detector of anything?

Colonel WALSH. The machine itself, no, sir. It merely records physiological responses to some external stimuli. The operator is the lie detector.

Mr. Moss. I think this matter of terminology in reference to this device is significant.

Colonel WALSH. Yes, sir.

Mr. Moss. In fact, there is no lie detector—mechanical, electronic, or of any other manmade nature.

Colonel WALSH. That is right.

Mr. Moss. Another group where there seems some agreement, most clearly acknowledged again by the Navy's response, is the case of heart or blood pressure conditions. Are these matters considered by your operators?

Colonel WALSH. Yes, sir.

Mr. Moss. Is that a judgment made by the operator himself?

Colonel WALSH. No, sir. Usually a condition of that sort we would hope would be determined during the pretest interview with the subject when he is asked the question.

Mr. Moss. Do you think that all persons who have blood pressure conditions are aware of it?

Colonel WALSH. No, sir. We would hope to determine some of those people and weed them out at this stage. However, if you put an individual on the machine, there may be a difficulty in getting him down to a norm, as I understand. I am getting into a technical area. I am not positive enough to say this for certain. In my conversations with the lie detector people, you must get a man down to a norm, to an area where you can get a reading.

If he has high blood pressure there may be some setoff or some inability to get a norm on the machine. As a result you then send him to the hospital or ask him to go to the hospital or ask him at this point if he is aware that he has a condition that cannot be brought to a norm on the instrument. So we would suggest he would go to the hospital.

Mr. Moss. So really the determinations, entrusted as they are to a trainee of some 7 weeks, are essentially medical determinations, are they not?

Colonel WALSH. No, sir.

Mr. Moss. Medical judgment?

Colonel WALSH. No, sir, they are not. I don't view them as such.

Mr. Moss. Would you want, Colonel, to diagnose a blood pressure condition?

Colonel WALSH. No, sir, I wouldn't.

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Mr. Moss. I would not either.

Colonel WALSH. I don't think we are qualified and I don't think we are attempting to do this.

Mr. Moss. It is the same way with mental deficients. What is a mental deficient?

Colonel WALSH. This would be an individual whose intelligence quotient is below an established norm. I believe it is below 80.

Mr. Moss. He might have dangerous psychosis, or potentially dangerous psychosis, and have a very high intelligence quotient.

Colonel WALSH. Yes.

Mr. Moss. Yet for a judgment whether he is deficient—in other words, you would equate mental deficiency with persons of low intelligence quotient as demonstrated by various standard intelligence tests given by the military service?

Colonel WALSH. This is my understanding.

Mr. Moss. Do you know whether persons with psychoses of various types would confuse or tend to distort results on the machine?

Colonel WALSH. I think they would, and there is a possibility they wouldn't. I think I might place a pathological liar in that broad category.

Mr. Moss. He might do very well with the machine.

Colonel WALSH. I think he might do very well; yes, sir.

Mr. Moss. The determination of a psychosis or a mental disturbance of any type is a rather complex judgment, is it not?

Colonel WALSH. I just can't answer it. It is just too technical.

Mr. Moss. Do you think it would be possible to train a person to detect that within a 7-week period?

Colonel WALSH. No, sir.

Mr. Moss. An addiction, unless it were very obvious addiction—the term we discussed earlier was alcohol or narcotics. Narcotic addiction, I suppose, is more readily ascertainable than other forms of addiction. Alcoholism can be hidden by people sometimes for many years if they are discreet in their periods of indulgence. These are difficult determinations, are they not?

Colonel WALSH. Yes, sir. Unless there is manifestation or statement by an individual. Outward manifestation.

Mr. Moss. Moving about with the equipment, as the Air Force does, do you encounter interference from fluorescent lighting equipment?

Colonel WALSH. Not to my knowledge. (See exhibit 10, p. 269.)

Mr. Moss. The Army includes a very definite warning in their manual to watch out for this—for electronic lighting equipment. I imagine this is where you would be operating these. Airbases frequently have rather large and complex electronic equipment.

Is there any determination whether this has an affect on polygraph results?

Colonel WALSH. We have never heard in the headquarters of this condition. If the condition existed I would presume, as the Army pointed out this morning, that there would be a peculiar pattern over and above any pattern that you might find.

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Mr. Moss. One that could not be duplicated by normal physiological responses?

Colonel WALSH. This is what I understood.

Mr. Moss. Or abnormal physiological responses?

Colonel WALSH. This is what I understood this morning.

Mr. Moss. Would you determine for the committee whether there has been any problem encountered by the Air Force in the use of polygraph equipment—any which might have been brought about by this type of interference or impact?

Colonel WALSH. Yes, sir.

Mr. Moss. Mr. Kass.

Mr. KASS. Earlier in asking the Navy witness a question, Congressman Reuss posed a hypothetical situation. If 30 or 50 individuals were in a particular barracks, and a theft had occurred in that particular barracks, what would the Air Force procedure be in using the polygraph?

Colonel WALSH. I don't want to appear to be quibbling, but to put it in context, we don't normally investigate that type of case. If confronted in a serious case—we only run it in more serious incident cases—however, we have run into where there have been a group of suspects, after the crime occurs our primary objective is to determine who had access.

Who would be the persons most likely to have committed the crime? There will be considerable investigation including interviews and also checking out alibis to try to isolate the group down to the absolute minimum. This group would be interviewed as to their knowledge concerning this particular offense. If from this group, we don't elicit through interrogation, the possible guilty party in the group, then we would resort to the lie detector as a means of further isolating the truthfuls from the group so we could concentrate on those who give us questionable reactions.

Mr. KASS. You would not use this at the beginning of the investigation?

Colonel WALSH. We don't use it as a last resort nor do we use it as a first resort. There is a point in space and time that you reach in an investigation where it becomes a valuable adjunct to your total invesigation.

Mr. KASS. At the point that you isolate these "truthfuls" that you just spoke about, do they go absolutely free or are they still suspects?

Colonel WALSH. The truthfuls go free. We have eliminated them from further examination.

Mr. KASS. Are they informed that they have been cleared as a result of the polygraph examination?

Colonel WALSH. No, we don't inform them.

Mr. KASS. If they ask, will go so tell them?

Colonel WALSH. I don't think we would so tell them.

Mr. KASS. Do your regulations have anything on this?

Colonel WALSH. No. This is a matter of discretion. I find that discretion is exerted in this manner. We recognize the infallibility of the lie detector. It is not infallible.

Mr. KASS. Could you repeat that?

Colonel WALSH. We recognize that the lie detector technique is not infallible. As a consequence we can't risk telling a man that he is

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innocent or that the machine has cleared him when in fact he may have beaten the machine. We have to really allow ourselves some flexibility here because maybe the man has beaten the machine and we recognize it can be beaten.

Mr. KASS. I have no further questions, Mr. Moss.

Mr. MOSS. I am interested in the fact that a man can be cleared by this machine. That would be a case of screening a group of suspects and clearing part and keeping others over because some of them just showed no suspicious responses.

Colonel WALSH. Yes, sir. We can recognize that.

Mr. MOSS. What if you have some pathological or some chronic liars?

Colonel WALSH. Sir, if I may phrase it in a slang phrase, it is a sort of the "name of the game." We are going to lose people that are guilty of offenses. But we would rather lose many than involve somebody that is not involved or is not guilty of an offense.

Mr. MOSS. Then this machine, or the results obtained from it, do play significant roles in investigations.

Colonel WALSH. Yes, sir; I think it does.

Mr. MOSS. It could eliminate a man from suspicion.

Colonel WALSH. Yes, sir; it does. That is why I said earlier based on our percentages, it is really a truth detector, if we want to coin a phrase, as opposed to lie detector. I don't like this terminology.

Mr. MOSS. Do you honestly believe those responses can establish truth or falsity of an individual?

Colonel WALSH. No, sir. I think in more precise terms that the individual in not attempting deception would be probably more precise rather than truthful. I think in the interests of trying to explain what we are saying we are oversimplifying by saying truth. There is no indication of deception in the case of an individual that we have ascribed the untruthful to. It is a case of indicating or giving indications of deception.

Mr. MOSS. If you took your group of 30 and we excused 25 of them and concentrated on the other 5 and came up with no guilty party, where do you go from there.

Colonel WALSH. Our work is still cut out for us. We still have a lot of investigating to do.

Mr. MOSS. Do you go over the 25 excused because of the polygraph readings?

Colonel WALSH. Yes, sir; I think we would go back and we do go back and try to get additional evidence that possibly we have missed somewhere along the line. In the way of clue evidence or trace evidence.

Mr. MOSS. Have you ever had such an experience?

Colonel WALSH. Yes, sir. We have had a recent experience.

Mr. MOSS. Where a person had passed successfully a polygraph examination and was subsequently reinvestigated?

Colonel WALSH. Yes, sir; we have had this experience. In fact, I think it was brought up earlier about Dr. Dearman concerning the banker, too, which would be another experience.

Mr. MOSS. Of course, that was a case where a person flunked the test on the polygraph.

Colonel WALSH. Yes, sir.

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Mr. Moss. Do you have any statistical studies to show the frequency with which this could or might have occurred?

Colonel WALSH. I am sorry, I didn't hear it all.

Mr. Moss. Do you have any studies to show the frequency with which this could or might have occurred? This type of development?

Colonel WALSH. I may have missed something here. To just get the air clear for myself and to make sure I understand, did you state that if we had a truthful response and then subsequently found the individual?

Mr. Moss. Yes.

Colonel WALSH. I missed the boat here. I was thinking of the Dr. Dearman article and got myself sidetracked. No, sir; I am not aware of any cases where we have had a truthful response and have subsequently come up with the same individual admitting he committed the offense.

Mr. Moss. Has the Air Force undertaken any independent research or evaluation on its own of the reliability of the polygraph?

Colonel WALSH. We have attempted. As indicated in Dr. Kubis' study, this is a field that is extremely difficult to come up with any degree of accuracy or reliability in the field. We have attempted within our own statistics to come up with something that tells us this, and this is what these figures say to us. That the lie detector instrument does work. From a layman's standpoint, I don't know exactly how this happens, but it does work. We have statistics, if the chairman would permit me——

Mr. Moss. Certainly.

Colonel WALSH. That gets into this area. Let me start with 1962, if I may—in calendar year 1962, for the entire year we administered 1,238 examinations. Out of this number, 925, or 75 percent, were found to be truthful or not practicing deception.

Mr. REUSS. You mean were found by the polygraph.

Colonel WALSH. No, sir; not by the polygraph but by the process, the lie detector technique.

Mr. REUSS. What does that involve besides the polygraph?

Colonel WALSH. This is the polygraph and the operator's opinion.

Mr. REUSS. Yes; of course.

Colonel WALSH. The number that were in the opinion of the operator practicing deception or untruthful was 275 or 22 percent of the total that were examined. Inconclusives, this is in areas where the operator had insufficient responses to permit him to make any determination one way or the other, was 3 percent or 38 of the total. Of the 22 percent, the number of untruthfuls, we were able to elicit 197 admissions or confessions which represents 72 percent of the untruthful group.

In 1963 we ran a similar study in the continental United States, and these figures changed where the number of truthfuls dropped to 66 percent. The number of untruthfuls went up to 28 percent. The number of inconclusives where no decision could be made went up to 6 percent. The number of admissions or confessions dropped to 61 percent. This 61 percent we find through previous years in continental United States is a consistent figure.

We have been in the sixties of this group that was untruthful or that was determined in the opinion of the operator to be untruthful

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where we were able to elicit confessions or admissions. It is a small group. However, from it I can draw the conclusion that the instrument or the technique, or the instrument and the examiner, works. I don't know why. But it works.

Mr. Moss. Can you really draw that conclusion? I can't. What was the other evidence that you had?

Colonel WALSH. Then we would have to from that point get some corroborating evidence.

Mr. Moss You have not correlated this to the nature of other evidence in those 22 percent of the cases or the lack of it in theo ther cases?

Colonel WALSH. That is right, sir.

Mr. Moss. Without that correlation this is merely an exercise in figures. It means absolutely nothing in evaluating either the instrument or the effectiveness of the operator.

Colonel WALSH. That is right, sir. We just don't have a scientific approach. We don't have the means to do it.

Mr. Moss. Yet, this type of statistical information is reinforcement for those who seek to expand the use of this type of equipment throughout Government. It has absolutely no validity.

Colonel WALSH. Other than in the terms that we do come up with admissions and confessions.

Mr. Moss. With the admissions and/or confessions obtained because the polygraph indicated that they might be untruthful?

Colonel WALSH. Yes, sir.

Mr. Moss. Colonel, I would suggest that you think most carefully.

Colonel WALSH. I would like to qualify it.

Mr. Moss. I think you should.

Colonel WALSH. I think some of these, I do not know what percentage of these—I am not certain whether we could even determine at this time—a good many of these would result before the individual took the examination. Before he was actually strapped to the instrument.

Mr. Moss. You might have had very pertinent evidence that was far more persuasive in the subsequent court-martial proceeding than the result of the polygraph.

Colonel WALSH. Sometimes there are some cases where there is no evidence and you have to rely on a confession to get a conviction.

Mr. Moss. How many of those cases have you? If we are going to take these statistics as having any pertinency at all, I think we must know how many of these were admissions or confessions without supporting evidence.

Colonel WALSH. I would have to furnish you with that. (See exhibit 10, p. 269.)

Mr. Moss. Is polygraph information admitted in courts-martial in the Air Force?

Colonel WALSH. No, sir, and it is not admitted in board proceedings.

Mr. REID. Would the chairman yield for one question?

Colonel WALSH. May I add one thing?

Mr. Moss. Yes, and then I will yield to Congressman Reid.

Colonel WALSH. We do know from court proceedings that an admission or confession that has been obtained as a result of the lie detector is admissible, although the results of a lie detector would not be admissible.

Mr. Moss. Colonel, Iwant to know how many of this 197 in 1962, and I forget the number in 1963——

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Colonel WALSH. 152.

Mr. Moss (continuing). Involved convictions or disciplinary action based solely on admissions and/or confessions obtained by use of the polygraph and had no supporting evidence. I will want the nature of the supporting evidence in each case. Mr. Reid.

Mr. REID. Thank you, Mr. Chairman. I just wanted to ask one question Colonel Walsh in pursuance of the line of inquiry by the chairman. You indicated here that you have possible confessions which are related to the use of the polygraph. Do you permit a person not to take a polygraph if he so elects and is there a waiver? And the second part of the question is, If the individual does not elect to sign a waiver, if there is such a thing—in other words, if he refuses to take a polygraph—would this, in the present frame of reference of your last response, lead you to any kind of indication as to guilt or innocence?

Colonel WALSH. No, sir; we don't attempt to make this determination.

Mr. REID. Does the individual sign a waiver in the first instance?

Colonel WALSH. No, sir, he does not sign a waiver. He just merely refuses to take the test and that is the end of it. There is no prejudice.

Mr. REID. Is that entered in the record one way or the other?

Colonel WALSH. We report it in our investigative report—to the effect that he refused to take the test.

Mr. REID. You do put it in the report?

Colonel WALSH. Yes, sir.

Mr. REID. But you say you attach no weight to it at all?

Colonel WALSH. No, sir.

Mr. REID. Do you advise the individual that he has every right not to take a polygraph test if he so elects?

Colonel WALSH. Very much. We read him article 31 and explain it to him fully and make certain he understands all the ramifications.

Mr. REID. So that he knows it will not prejudice one way or the other the determination of his case whether he takes a polygraph or not.

Colonel WALSH. Yes, sir.

Mr. REID. You say that you have sought confessions on the basis of a polygraph alone?

Colonel WALSH. Yes, sir; when there is no other evidence and the investigation may point to a particular individual.

Mr. REID. Thank you, Mr. Chairman.

Mr. Moss. Mr. Reuss.

Mr. REUSS. Mr. Chairman, I, too, would like the Air Force to supplement this data a bit. For the year 1962 you indicate that 270 examinees were stigmatized by the polygraph as untruthful and of those 197 were subsequently convicted. You will furnish the information?

Colonel WALSH. Yes.

Mr. REUSS. I am not interested in the 197 that were convicted but in the 78 in that year that were not convicted, and I would like the same information for 1963. Give me the information as to the crime for which each one of these nonconvicted people were being examined and then give the ultimate disposition of that particular crime.

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Similarly for both years, among the examinees who were found truthful, give the crime with which they were connected and the ultimate disposition of that prosecution for both years.

Colonel WALSH. May I ask something on that last one?

Mr. REUSS. Yes.

Colonel WALSH. I don't think there would be any prosecution involved in regard to these individuals.

Mr. REUSS. To the innocent ones.

Colonel WALSH. Yes, sir.

Mr. REUSS. Tell me whether the particular crime was cleared up and who was found guilty.

Colonel WALSH. I will attempt to do that. I do not know whether I can do it that well.

Mr. REUSS. At least tell me whether the crime was cleared up and if somebody was found guilty and it was verified that it was not the person who was earlier categorized as innocent by the polygraph.

Colonel WALSH. Yes, sir.

Mr. REUSS. Thank you.

Mr. MOSS. Are there further questions?

Mr. REUSS. I have just one more question. This Air Force contract study by Fordham University in 1962 entitled, "Studies in Lie Detection Computer Feasibility Considerations." I believe you testified that the net result of that study was the finding that it was not feasible to substitute a computer for the operator.

Colonel WALSH. Yes, sir; at this time. They felt there had to be more work and there are follow-on studies.

Mr. REUSS. How much did this study in June 1962 cost the Air Force?

Colonel WALSH. I will have to get that information.

Mr. MOSS. Would you yield at that point?

Mr. REUSS. Yes.

Mr. MOSS. There are follow-on studies on this?

Colonel WALSH. Yes, sir.

Mr. MOSS. This committee is charged with examining into the economy and efficiency of the Government. I will say there will be a letter directed to the Secretary of the Department of the Air Force suggesting that studies of that type in that field be held in abeyance and no further contracts made until such time as there have been some valid grounds established to accept the polygraph as a reliable scientific instrument for any purpose other than that of measuring physiological response. Mr. Archibald, will you see that letter is prepared at a very early date?

Mr. REUSS. In that connection, let us find out what additional studies on whether computers can replace live operators of lie detector apparatuses are being funded by the Air Force. You have suggested that some are now in the process.

Colonel WALSH. Yes, I understand this. Not under my cognizance.

Mr. REUSS. You will find out and inform us?

Colonel WALSH. Yes, sir.

Mr. REUSS. You have no idea what these studies cost the Government?

Colonel WALSH. No, sir; not offhand.

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Mr. REUSS. Has the Air Force ever commissioned any university or other learned organization to study whether the lie detector has any real validity or usefulness?

Colonel WALSH. Not under my cognizance. I can't answer that question. I would have to determine that. There may be studies being run independent of my organization.

Mr. Moss. As as observation of the chairman, I think the Air Force has moved far ahead of any prudent base for this type of study. I regard it as a flagrant waste of public funds to contemplate hooking a computer to an instrument of such doubtful value and removing completely any human judgment regardless of how inadequately trained it might be.

Mr. REUSS. It is about like financing a study by the Surgeon General to determine whether goat-gland treatments can be administered by a computer. It would be much better to find answers to the fundamental questions first.

Mr. Moss. I have been impressed by the complete lack of reference by any of the military departments to their excellent medical departments for assistance in evaluating the polygraph. Some of the finest medical specialists in psychiatry in this country are to be found in the services. And yet there has been no reference to those men of this problem, no effort to secure an evaluation or guidance, no involvement in the training programs which I think are most inadequate. Then we encounter a contract of this type where we want to hook up a computer and have it take over the role of the operator. It amazes me. Are there any further questions? Mr. Kass.

Mr. KASS. Colonel Walsh, will the Department of the Air Force give polygraph exams to children?

Colonel WALSH. No, sir. I can't think of a situation where we would authorize it.

Mr. KASS. This document. OSI Manual, 124–1, dated September 1962, chapter 2 on lie detection, paragraphs 2–2–9, states:

> Children are not ordinarily fit subjects for lie detector examinations. Only under most unusual circumstances, and then only after approval has been obtained from the Directorate, will children be examined by OSI lie detector examinations.

Will you comment in light of your earlier statement?

Colonel WALSH. I say no; we wouldn't. It is a point of reference. It is the area we define children. I would say possibly a youngster of 16 or 17 might if an occasion arose, where the individual would have made an allegation or be a victim or be a suspect. If it was a serious matter, possibly serious security matter, we might attempt to put the individual on the lie detector to test his veracity. However, we would not do it unless it was one of these serious categories and then we would have to have a medical doctor's okay.

Mr. KASS. What is this Directorate that must give approval?

Colonel WALSH. This is in Washington.

Mr. KASS. Have you defined in your regulation what you mean by children?

Colonel WALSH. I think it is in the Uniform Code of Military Justice. That is the point of reference we take. I believe it is 18 or anything under 18 is considered a minor child.

Mr. Moss. Mr. Reid.

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Mr. REID. Colonel Walsh, I have just one further question, and I understand that you are going to supply the information on this in some detail at the request of the chairman. But for the purpose of this record today, could I again refer to this study of Air Force polygraph usage for 1962 and section (C) wherein it is stated:

> Of the examinees whose charts reflected deception, 72 percent, 197 examinees, subsequently furnished admissions and/or confessions.

A minute ago you said that some confessions you believe were received largely or almost entirely as a result of a polygraph exam. Could you tell us how you get an admission or a confession? Do you solicit this? Is there any encouragement given to an individual to make an admission or a confession?

Colonel WALSH. No, sir. It is a matter of the polygraph being used as an adjunct to the total investigation and the total interrogation. This is just a psychological aid.

Mr. REID. Just take the one case that I was particularly struck by that you mentioned a little bit ago—that you believed you had some instances of a confession solely as the result of a polygraph exam and without any substantial supporting evidence other than the polygraph. How on earth, therefore, do you then get a confession from the individual? Does he volunteer it?

Colonel WALSH. Yes, sir.

Mr. REID. How does he know that the polygraph shows any guilt or innocence? Do you inform him of this?

Colonel WALSH. Yes, sir; we do.

Mr. REID. You inform him that the polygraph shows what?

Colonel WALSH. That to certain questions he indicates a reaction, a reaction that is indicative of deception. We want to know why this reaction at this point.

Mr. REID. Having informed him that in the instant polygraph test there has been a reaction indicative of deception, what do you suggest to the individual?

Colonel WALSH. That he may have had some knowledge or some connection with the offense which we are investigating.

Mr. REID. Then what do you say?

Colonel WALSH. We continue the interrogation.

Mr. REID. Do you encourage, directly or indirectly, a confession based on that kind of statement?

Colonel WALSH. Not this alone; no, sir. Not this alone. First of all, to get to the point of the lie detector we have had to have some circumstantial evidence.

Mr. REID. I gathered from one statement of yours that there were some instances wherein you thought the polygraph alone was the principal evidence that led you to believe that some kind of crime had been committed.

Colonel WALSH. No, sir. This is only part. We only use it as an investigation aid and as an adjunct to the interrogation itself.

Mr. REID. To get back to your earlier statement, during the process of the polygraph exam you do inform the individual of the results of that polygraph?

Colonel WALSH. Yes, sir.

Mr. REID. You said further that sometimes when you so inform him you indicate there are reactions indicative of trying to deceive.

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Colonel WALSH. Yes, sir.

Mr. REID. Is that not influencing the individual? Are you not suggesting certain things to him at that point?

Colonel WALSH. We are only suggesting that he might be the suspect that we are looking for for that crime; that if he is not, he has some knowledge or may have some knowledge of that crime.

Mr. REID. Could this not be a form of intimidation?

Colonel WALSH. No, sir; we don't feel that way.

Mr. REID. You don't think the individual would be upset if he were informed that he was practicing deceit according to the lie detector?

Colonel WALSH. No, sir. He knows whether he is or is not.

Mr. REID. Thank you, Colonel.

Mr. MOSS. Are there any further questions? If not, Colonel, I want to thank you for your appearance here this afternoon and you are excused.

Colonel WALSH. Thank you, sir.

Mr. MOSS. The subcommittee will adjourn. Before adjourning, I would like to ask unanimous consent for the staff to insert in the record of the 4 days of these hearings at the appropriate points documents mentioned or pertinent to the discussion.

If there is no objection, that permission is granted. The subcommittee will now adjourn, and further scheduled hearings will be announced later.

(Whereupon, at 4:40 p.m. the subcommittee adjourned, subject to call of the Chair.)

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APPENDIXES

EXHIBITS 10A–10C—INFORMATION FURNISHED BY THE DEPARTMENT OF THE AIR FORCE

EXHIBIT 10A—LETTER FROM COL. JAMES M. MCGARRY, JR., U.S. AIR FORCE, TO HON. JOHN E. MOSS, MAY 5, 1964

DEPARTMENT OF THE AIR FORCE,
OFFICE OF THE SECRETARY,
Washington, May 5, 1964.

Hon. JOHN MOSS,
Chairman, Foreign Operations and Government Information Subcommittee, Committee on Government Operations, House of Representatives.

DEAR MR. CHAIRMAN: During your hearings on the use of lie-detection equipment by the Federal agencies, you requested the Air Force witness to provide certain additional information in connection with testimony given on April 10, 1964. The questions asked, together with the response to each, based on information in Office of Special Investigations' files, are forwarded herewith. You will note that attachment 1 relates to polygraph examinations conducted during 1962 and attachment 2 concerns examinations conducted in 1963.

During the questioning of Colonel Walsh (p. 426 of the transcript), you asked whether polygraph equipment has encountered interference from fluorescent lighting. Polygraph examiners at 10 of 41 OSI district offices, worldwide, encountered occasional interference with the galvanometer component of the polygraph while operating in an area in which fluorescent lighting was utilized. This condition was immediately recognized and corrected by grounding the instrument chassis, which is a normal and accepted practice in instances of this nature.

It is a pleasure to be of service to you in this matter.

Sincerely,

JAMES M. MCGARRY, JR.,
Colonel, U.S. Air Force, Assistant Director for Legislation and Investigations, Legislative Liaison.

EXHIBIT 10B—STUDY OF AIR FORCE POLYGRAPH USAGE IN CONUS FOR CALENDAR YEAR 1962

A study was conducted by OSI into the 1,238 polygraph examinations conducted in the CONUS during calendar year 1962. The following significant results were noted:

(*a*) In 75 percent (925 examinees) of the examinations, charts reflected the examinee was truthful in answers to all questions.

(*b*) In 22 percent (275 examinees) of the examinations, charts reflected examinee was untruthful in his answers.

(*c*) Of the examinees whose charts reflected deception, 72 percent (197 examinees) subsequently furnished admissions and/or confessions.

(*d*) In 3 percent (38 examinees) of the examinations, charts failed to reflect sufficient significant information upon which to base an opinion and, therefore, were inconclusive.

EXHIBIT 10C—AIR FORCE POLYGRAPH EXAMINATIONS IN CONUS FOR 1962

	Number	Percentage
Number truthful	925	75
Number untruthful	275	22
Inconclusives	38	3
Number of examinations administered	1,238	
Admissions or confessions	197	[1] 72

[1] Of untruthful.

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Subcommittee question. How many of the 197 persons who gave admissions or confessions did so as a result of being confronted with polygraph charts evidencing deception and with no other existing evidence at that time?

Answer. Twenty-three individuals (11.6 percent) gave admissions or confessions under such circumstances.

Subcommittee question. Of the number who gave admissions or confessions under the above circumstances how many subsequently had action taken and what was the nature of the action?

Answer. Thirteen of the twenty-three individuals who gave admissions or confessions as a result of being confronted with deceptive polygraph reactions subsequently had actions taken concerning them as follows:

(*a*) Two were convicted by courts-martial.
(*b*) Ten were separated from the service through administrative action.
(*c*) One was retained in the service.

Subcommittee question. In connection with the individuals who gave admissions or confessions and had action taken against them (13), state the nature of the supporting evidence in each case, if any.

Answer. In three of these cases, all involving sex offenses, OSI developed supporting evidence.[1] In two of these instances the supporting evidence consisted of coparticipant corroboration. In one case the investigation was supported by a complainant's allegation and subsequent identification of the examinee as the perpetrator.

Subcommittee question. Identify those instances of individuals (78) who manifested reactions indicative of deception but did not subsequently give an admission or confession. Indicate the nature of the investigation concerning which they were examined and give the ultimate disposition of the investigation.

Answer. There were 78 individuals in this category (275 untruthful minus 197 who gave admissions or confessions equals 78). They were examined in connection with 68 investigations. The statistics concerning these individuals, the nature of the investigation, and the ultimate disposition of the matter are as follows:

(*a*) Two of these individuals were examined in connection with security type investigations.
(*b*) Sixty-eight were examined in connection with criminal investigations.
(*c*) Eight were examined in connection with investigations for other governmental agencies.

Solely from an OSI investigative standpoint, 37 of these investigations were considered to be cleared up, in that the elements of proof constituting the offense were established by the OSI and a subject was identified.

The results of the OSI investigations in each instance were furnished to the appropriate commanders. In subsequent correspondence from the commanders concerned, it was determined that the following dispositions were made regarding the 78 individuals:

(*a*) Two individuals examined in connection with two security type investigations did not have any action taken against them.
(*b*) Sixty-eight individuals examined in connection with 62 criminal type investigations had actions taken as follows:
(1) Five were convicted and five acquitted in trials by courts-martial.
(2) Seven were separated and one retained in the service through administrative boards.
(3) Other actions, short of courts-martial or involuntary discharge were taken against 11 individuals.
(4) The remaining 39 individuals had no action taken against them.
(*c*) In examinations conducted for other agencies no action was taken against four individuals while in four other instances, the report of action taken has not been received by OSI.[2]

Subcommittee question. Concerning the 78 individuals examined who manifested reactions indicative of deception but who did not subsequently give admissions or confessions, state whether there was supporting evidence and give the nature of the supporting evidence.

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[1] For the purposes of OSI investigations, supporting evidence is defined as any information developed which directly or indirectly connects the individual concerned with the offense under investigation.
[2] Ordinarily the action taken by the agencies outside the Air Force for which OSI conducts these examinations is not furnished to OSI.

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Answer. Of the 78 individuals examined, there was supporting evidence gathered concerning 49 of them. The nature of this supporting evidence was as follows:

(*a*) Twenty-six statements of coparticipants.
(*b*) Five statements of witnesses.
(*c*) Eight statements and identifications by complainants.
(*d*) Two instances where the stolen property had been recovered through authorized searches of the individuals' effects.
(*e*) Three instances of documentary evidence in the form of property records and certifications executed by the examinees.
(*f*) One instance of physical evidence located at the scene.
(*g*) Two instances of medical examinations of victims.
(*h*) One instance in which the individual concerned attempted to sell the stolen property.
(*i*) One instance of physical evidence (weapon) recovered from individual.

Subcommittee question. Among the examinees who were found truthful (925), what was the nature of the investigation with which they were connected?

Answer. Three hundred and eight of the individuals were examined in connection with security investigations, 557 were examined in connection with criminal investigations, and 60 were examined in connection with security or criminal investigations for agencies outside of the U.S. Air Force.

Subcommittee question. Was the particular investigation cleared up?

Answer. The 925 individuals considered truthful were examined in connection with 397 investigations. Of these investigations, 182 investigations involving 232 individuals were cleared up in that OSI, through other investigative effort, developed clear-cut, independent facts showing that these individuals were not and could not have been involved in or responsible for the offense being investigated. Inasmuch as the OSI investigations involving the remaining 693 individuals failed to clear up the matter and were closed as "unknown subject," there was no way to confirm, in fact, the truthfulness of these individuals.

Air Force polygraph examinations in Conus for 1963

	Number	Percentage
Number truthful	579	66
Number untruthful	249	28
Inconclusives	47	6
Number of examinations administered	875	
Admissions or confessions	152	[1] 61

[1] Of untruthful.

Subcommittee question. How many of the 152 persons who gave admissions or confessions did so as a result of being confronted with polygraph charts evidencing deception and with no other existing evidence at that time?

Answer. Twenty-one individuals (13.8 percent) gave admissions or confessions under such circumstances.

Subcommittee question. Of the number who gave admissions or confessions under the above circumstances how many subsequently had action taken and what was the nature of the action?

Answer. Eleven individuals who gave admissions or confessions as a result of being confronted with deceptive polygraph reactions subsequently had actions taken concerning them as follows:

(*a*) Three were separated from the service through administrative board actions.
(*b*) Two were convicted by courts-martial.
(*c*) One was acquitted by court-martial.
(*d*) Other actions, short of courts-martial or involuntary discharge were taken against five individuals.

Subcommittee question. In connection with the individuals who gave admissions or confessions and had action taken against them, state the nature of the supporting evidence in each case, if any.

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Answer. In one of these cases, involving sex offenses, OSI developed supporting evidence[3] in the form of coparticipant corroboration. In another of these investigations, involving bad checks, there was eyewitness testimony. In a third investigation involving housebreaking, the fingerprints of the examinee were found at the scene of the crime.

Subcommittee question: Identify those instances of individuals (97) who manifested reactions indicative of deception but did not subsequently give an admission or confession. Indicate the nature of the investigation concerning which they were examined and give the ultimate disposition of the investigations.

Answer. There were 97 individuals in this category (249 untruthful minus 152 who gave admissions or confessions equals 97). They were examined in connection with 83 investigations. The statistics concerning these individuals, the nature of the investigation and the ultimate disposition of the matter are as follows:

(*a*) Three of these individuals were examined in connection with security type investigations.

(*b*) Eighty-nine were examined in connection with criminal investigations.

(*c*) Five were examined in connection with investigations for other governmental agencies.

Solely from an OSI investigative standpoint, 37 of these investigations were considered to be cleared up, in that the elements of proof constituting the offense were established by OSI and a subject was identified.

The results of the OSI investigations in each instance were furnished to the appropriate commanders. In subsequent correspondence from the commanders concerned it was determined that the following dispositions were made regarding the 97 individuals.

(*a*) Two individuals examined in connection with the two security-type investigations did not have any action taken against them.

(*b*) Eighty-nine individuals examined in connection with 75 criminal-type investigations had actions taken as follows:

(1) Two were convicted and three acquitted in trials by courts-martial.

(2) Ten were separated from the service by administrative boards.

(3) Other actions, short of courts-martial or involuntary discharge, were taken against eight individuals.

(4) In 21 instances the investigation concerning which the individual was examined is still pending or the action has not yet been taken and/or reported.

(5) The remaining 51 individuals had no action taken against them.

Subcommittee question. Concerning the 97 individuals examined who manifested reactions indicative of deception but who did not subsequently give admissions or confessions, state whether there was supporting evidence and give the nature of the supporting evidence.

Answer. Of the 97 individuals examined, there was supporting evidence gathered concerning 55 of them. The nature of this supporting evidence was as follows:

(*a*) Twenty-five statements of coparticipants.
(*b*) Thirteen statements of witnesses.
(*c*) There was documentary evidence in seven cases.
(*d*) Six instances of identification by victims.
(*e*) Two statements and identifications by complainants.
(*f*) One positive laboratory analysis (handwriting).
(*g*) One instance of information developed from a national agency check.

Subcommittee question. Among the examinees who were found truthful (579), what was the nature of the investigation with which they were connected?

Answer. One hundred and twenty of the individuals were examined in connection with security investigations, 422 were examined in connection with criminal investigations, and 37 were examined in connection with security and/or criminal investigations for agencies outside of the U.S. Air Force.

Subcommittee question. Was the particular investigation cleared up?

Answer. The 579 truthful individuals were examined in connection with 278 investigations. Of these investigations, 106 investigations involving 127 indi-

[3] For the purposes of OSI investigations, supporting evidence is defined as any information developed which directly or indirectly connects the individual concerned with the offense under investigation.

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viduals were cleared up in that OSI, through other investigative effort, developed clear-cut, independent facts showing that these individuals were not and could not have been involved in or responsible for the offense being investigated. Inasmuch as the OSI investigations involving the remaining 452 individuals failed to clear up the matter and were closed as "unknown subject," there was no way to confirm, in fact, the truthfulness of these individuals.

EXHIBIT 11—THE POLYGRAPH: ITS CAPABILITIES AND LIMITATIONS IN SECURITY CLEARANCES

[Article from July 1951 issue of ONI Review]

There has been much speculation recently as to the value of the polygraph in effecting security clearances. The polygraph is a delicate and complicated piece of machinery, which has specific capabilities in the hands of an experienced and intelligent operator, and also definite limitations.

The author of this article, a former student of the late Dr. Leonarde Keeler, internationally known criminologist considered by many qualified persons as the foremost exponent of his time in polygraph technique, has been for many years in charge of special operations for the Security Branch of the Office of Naval Intelligence.

The polygraph, commonly known as a lie detector, is a mechanical and electrical device used to detect and record certain physiological changes which are induced in an individual by his emotional response to certain questions, this response being involuntary for the most part. Relative changes in blood pressure, rapidity and amplitude of the pulse, variations in the respiratory pattern, and minute changes in the conductivity of the skin are detected by the instrument and recorded as a continuous graph or chart.

There are therefore three definite factors involved in the operation of the polygraph. One, a blood pressure cuff sends pneumatic impulses through a tambour assembly which is essentially a delicate bellows, the movement of which activates a pen which charts the rate of pulse, amplitude of the heartbeat, variations in blood pressure and in general gives a picture of the heart in action. Next, a rubber expansion tube, held in place around the chest and activated by the movement of the diaphragm, causes a recording to be made of the respiratory pattern. The rate of breathing, shallowness or depth of respiration, blockage, muscular tremors, and any other irregularity is recorded. Finally, a pair of electrodes, attached to the hand of the person being examined, are connected to an electrical circuit which also contains an amplifier unit. This assembly, usually known as the galvanograph, is used to measure and record minute changes in the conductivity of the skin. The principle is much like that of a water wheel which, when two equal forces of water are directed against it, remains stationary. When the pressure of one force becomes greater than that of the other, the wheel moves in the direction in which the greater force is being applied. In the polygraph the machine is adjusted to match the conductivity of the skin, the machine being constant as the skin's conductivity undergoes a change. That change is translated into the movement of a pen.

The blood pressure, pulse, and respiratory patterns are considered to be the most reliable means of detection. The galvanograph, which records changes in the conductivity of the skin, is reliable enough in laboratory experiments. For example, a subject is asked to look at six or seven playing cards and to select one of them. He is instructed to lie concerning the card he has selected. A phlegmatic individual being thus tested in familiar surroundings and lying according to specific instructions will in an extremely high percentage of cases reveal his choice to the examiner. The deviation from his lifelong training, plus the extra effort involved in lying, sets up a sufficient emotional response to enable this sensitive apparatus to pick up the resulting physiological changes. Unfortunately, the galvanograph too often becomes erratic when used in actual cases. The precise factors involved are not too well known but the results indicate that this particular assembly is overstimulated and sets up secondary factors which result in a highly erratic graph not susceptible to diagnosis.

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Attempts at detection of deception through psychological and physiological means may be traced back through many centuries. A typical attempt to ascertain the truth through physiological means consisted of requiring a witness or suspect to testify with a quantity of rice in his mouth. If the rice remained dry the individual was thought to be lying, on the theory that the salivary glands of such a person would dry up while he was giving untruthful testimony. This rather crude attempt might nevertheless be considered basically sound in theory. From the psychological standpoint, suspects in a particular case were compelled to enter one by one, a darkened room where they were instructed to grasp the tail of a donkey who reputedly would bray when touched by the guilty person. Unknown to the suspects, the animal's tail was coated with a substance similar to lamp black. The hands of each individual would be examined when he returned from this room. The man with clean hands was indicated as guilty on the theory that the guilty person would refrain from touching the animal and thus hoped to escape detection. The first attempt to utilize an instrument similar to the modern polygraph occurred about 1895. At that time Cesare Lombroso, the Italian criminologist,[1] conducted several experiments on suspected criminals seeking to determine their innocence or guilt on the basis of changes, or absence of changes, in blood pressure and pulse. In the United States, in 1921, John A. Larson, working under Chief August Vollmer of the Berkeley (Calif.) Police Department, conducted several hundred similar tests. Beginning in 1925, Dr. Leonarde Keeler began experiments in California which he continued in the Scientific Crime Detection Laboratory at Northwestern University and in private practice until his death in 1949. With the aid of capable technicians and consultants, Keeler evolved the polygraph as it is known today. His case histories exceeded 25,000 and he is generally conceded to have made the greatest single contribution to the science of the detection of deception.

Purely mechanical operation of the polygraph to the point where the instrument is operating and producing a graph is a skill which can be acquired in a very short period of time. At this point the embryonic examiner is able to adjust the apparatus so that the blood pressure cuff, chest expansion tube and electrodes are transmitting the necessary impulses to the polygraph and producing a graph. Here, comparatively speaking, the operator knows about as much as the medical student who has been shown a stethoscope, informed as to its name and purpose and told where to place it. The novice polygraph operator can now produce a chart, and the medical student is in a position to listen to a patient's heart beat. In both cases, only prolonged study and experience will enable each to make a correct diagnosis. In one case the problem is to diagnose the condition of the patient's heart on the basis of sounds heard through the stethoscope. In the other the polygraph examiner must learn to interpret correctly the charts which the instrument brings to him. This is by far the most difficult part of the examination and in its very nature allows for an almost infinite variance in skill among operators. The proficiency of the examiner, as in the case of any machine or instrument which requires interpretation or diagnosis, has an all important bearing on the results obtained.

Two types of examination are commonly used. One is called the "peak of tension test," the other the "specific response test." Claims regarding accuracy in these tests vary greatly. Certain examiners have made claims of as high as 99-percent accuracy. Such claims are exaggerated, and if made in good faith are based on insufficient evidence and experience. On the other hand, they may be deliberate, with a knowledge or suspicion of the true facts. The best available statistics indicate that a highly skilled examiner, using the best instrument obtainable, will attain results in not more than 75 percent of cases. Such an operator will find that a small percentage of those examined, from 1 to 2 percent, are unresponsive. He will have a margin of error approximating 5 percent, and in approximately 20 percent of the examinations his records will be too indefinite or too ambiguous to permit him to make conscientiously a positive diagnosis.

The "Peak of Tension Test" is generally considered to be the more reliable of the two most commonly used tests. Its disadvantage is that circumstances of a case very often forbid its use. An example of a hypothetical case might perhaps illustrate this more vividly than an abstract description. A burglary

[1] Lombroso is also known for his erroneous theory that a unique criminal physiognomy existed which could be classified like fingerprints.

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is committed in a certain city. The mode of entry, the method of forcing a strongbox, the fact that jewelry only was selected, leads the investigator to select from the police department's MO (modus operandi) file, certain likely candidates, excluding those who are impossibles by reason of present incarceration, etc. A "Peak of Tension Test" may eliminate certain of these suspects, and may indicate the guilty person, provided, that a description of the articles taken has not been published or otherwise disclosed. A series of approximately 10 questions is prepared, each asking a suspect, "Did you steal a pearl necklace?" "Did you steal a diamond stickpin?" etc. All of the articles named in these questions are fictitious except 1, which is located somewhere between the first and the last of the 10 questions, and is usually the sixth, seventh, or eighth question. The questions are shown to the subject before the examination begins. Whether he is nervous or phlegmatic, it is obvious that his responses to these questions will be entirely insignificant or erratic if he is innocent. If guilty, or if he has knowledge of the stolen goods through a disclosure to him by the actual burglar, he immediately sees and concentrates upon the one pertinent question concerning which he must attempt to conceal his emotions and lie. This results usually in a rather graphic increase in blood pressure up to the asking of this one pertinent question, with a decrease in pressure after the hurdle has been passed. It is obvious, however, that in many or most cases, publication of details concerning an offense makes it possible for an individual being examined to react to a pertinent question because of knowledge acquired through innocent means.

The "Specific Response Test" consists in asking a series of relevant and irrelevant questions. The exact sequence of these questions differs among various examiners. These questions shoud be worded so as to permit an answer of either "Yes" or "No." This is most important in order that the respiratory pattern be undisturbed other than by the individual's emotional reaction of the question. In this test the most reliable indication of deception is a simultaneous change in respiration and increase in blood pressure immediately after an answer is given to a pertinent question. The change mentioned must constitute a deviation from the subject's norm—which norm must have been established previously. Unfortunately, this simultaneous indication is not seen in every case. Specific responses in either the blood pressure or respiration are more common. Decrease in blood pressure, change in pulse rate, or an increase or decrease in the amplitude of the heartbeat may also indicate deception, but a diagnosis of a chart as indicating deception must take into consideration every possible pertinent factor. The number of these factors is too great to be gone into in an article of this nature. Apparently contradictory indications of deception may appear, the clarification of which calls for the greatest care and skill in analyzing these contradictions and in reframing or utilizing questions which will produce the necessary elimination or clarification.

The greatest single factor which affects an untruthful response is the fear of detection and the extra effort used in the attempt to deceive. The conflict set up by a sense of wrongdoing or the emotion of remorse also contributes, but in a minor way. There are many possible factors which may render a correct diagnosis of the polygraph chart extremely difficult. These include emotional tension, such as nervousness in a guilty person, or tension aroused in an innocent person by the mere fact that a direct or indirect accusation has been made against him. Similarly, an innocent person may show indications of deception when he possesses a guilt complex surrounding an offense similar to, but different from, the incident concerning which he is being questioned. Usually a skilled examiner is able to detect and eliminate from consideration indications prompted by these factors. Physiological abnormalities such as respiratory disorders or very high or low blood pressure and mental abnormalities such as feeblemindedness (idiot, imbecile, moron, IQ range 0 to 70) or the presence of a psychosis (manic depressive, schizophrenia, paranoia) together with psychoneurosis, tend to render a subject unfit for examination. In the case of mental abnormalities, irregularity of the respiratory pattern is usually present and constitutes a practical warning to the operator. Unresponsiveness of a guilty subject may be caused by lack of fear of detection, control of responses by a mental attitude, by a condition of subshock, by rationalization of the offense, or by prior extensive interrogation. This prior interrogation may itself produce a condition of subshock which might be described as the effects of adrenalin exhaustion. Rationalization of the offense occurs often in hardened criminals who are convinced that their conduct is completely justified.

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Questions should be framed with the utmost possible precision. They should be short, avoid the injection of extraneous matter, worded so as to eliminate a false response caused by word association, and capable of being answered by "Yes" or "No" responses. The more knowledge an examiner has of a subject and the incident involved, the greater his chance of a successful examination. If possible, the subject should be balanced on a figurative point from which he may jump either into a black or white area—but only in either of these positions. In the "Specific Response Test" certain irrelevant questions are asked in order to establish a norm. Theoretically, it is possible that any apparently irrelevant question may be of the highest pertinency to the individual being examined. For example, an apparently irrelevant question such as "Are you married?" is utilized in order to help establish a norm. If the subject is married, a fact known to the examiner, but was caught by his wife a week before in flagrante delicto, a fact not known to the examiner, and faces divorce and the payment of large alimony, then this seemingly innocuous question may produce striking and startling results. While this is admittedly an extreme example, it may serve to illustrate the point that the more knowledge the examiner has of the individual he is to examine, the more precisely he may frame his questions in order to establish a true norm, and also avoid misleading indications caused by word association or by any of the other factors which tend to make a polygraph diagnosis a delicate and often difficult operation.

The proper function of the polygraph is as an aid to interrogation. Interrogation is a specific investigative technique which in almost all cases follows and does not precede those other investigative techniques which may be employed in a particular case. Utilization of the polygraph alone as a security clearance technique cannot be recommended except in the most unusual cases where, because of particular circumstances, no other avenue of investigation is open. It should be restricted, if used at all, to cautious use by skilled operators, and considered merely as one of the techniques of investigation to which it can be a valuable adjunct. Used as an initial and sole investigative technique, the best coverage within the possibilities of the machine would require a gradual sharpening of questions after a somewhat blunt initial application. This would necessitate several separate examinations of the subject each consisting of several runs in order that ambiguities might be resolved and contradictions be eliminated. As a process it would be time consuming rather than timesaving, cumbersome, and extremely limited in clearance value.

One of the most valuable applications of the polygraph as an initial technique in an investigation occurs where several suspects are involved and where circumstances indicate that one of these suspects is guilty but where evidence points fairly equally to all of them. Elimination by use of the instrument is a valuable timesaver, but here the knowledge that the guilty person is one of a small and definite group necessarily implies that a considerable amount of information concerning the circumstances of the offense or incident is available before the polygraph examinations are made.

So far, it has been shown that there are certain limitations in the use of the polygraph. Some of these are: the fact that 75 percent represents a reasonably high percentage of cases in which examination on the machine produces definite and positive results; the fact that thoroughly trained, experienced and skilled operators who are completely objective in viewpoint are required; and the fact that accepted and proper usage limits the polygraph as but one of many scientific investigative techniques. The polygraph is a valuable aid in its proper place but no more so than the technique of fingerprint examination and classification, ballistics, or the examination of questioned documents.

There is also another important factor that cannot be overlooked in a discussion of the machine—the eliminating of evasion, deception, or "beat the machine" technique sometimes employed by persons being examined. Falsification of polygraph recordings in such a manner as to be imperceptible to the operator and not detectible by any distortion of the charts, has been achieved in laboratory experiments, and in turn met by effective countermeasures. There is, however, an inevitable timelag between the initiation of a specific evasion technique, its recognition, and the employment of effective countermeasures. It is therefore possible that presently unknown evasive techniques may be developed. If so, it would have to be assumed that subversive individuals attempting to infiltrate the Government would be adequately briefed in their use. It follows that any policy predicating security clearances on results from the machine alone, without utilization of the more orthodox investigative tech-

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niques, contains a margin of error too great for comfort, and could conceivably constitute an enormous aid to disqualified persons attempting to penetrate the security defenses of the Government.

The polygraph is a valuable tool when properly utilized and when entrusted to a skillful and conscientious examiner. A recognition of its limitations, in addition to those discussed above, must also include in its evaluation the opinion of the judiciary which is to the effect that it has not as yet attained a standard of reliability to the point where it may be admitted as legal evidence. Further, the Department of the Navy is contributing at the present time, together with other departments of the Defense Establishment, to a research project which is attempting to explore the field of deception criteria, recognizing that research into examination methods has not kept pace with development of the mechanical aspects of the machine itself. Many, if not most, experienced operators, will decline to diagnose charts resulting from an examination conducted by another without their presence. This attitude points not only to a lack of standardization as to what constitutes deception criteria, but also strongly indicates that many experienced operators, who usually are also experienced interrogators, consciously or otherwise place considerable reliance upon their sizing up of an individual, and often secure a confession following a polygraph examination and then read into the chart deception indications which agree with the confession they have received.

With the present great expansion of the Defense Establishment, a method which gives promise of quick security clearances is certain to be examined with interest. The polygraph is a valuable adjunct to the many investigative techniques which are utilized to scrutinize and establish the loyalty of individuals who are to occupy sensitive positions. However, an improper use of this instrument will produce security clearances which are worse than nothing in that they give a dangerous illusion of security which might in particular instances result in the most far-reaching and dangerous results.

EXHIBIT 12—POLYGRAPH EXAMINER SELECTION

[From the Military Police Journal, April 1964]

A method of selecting men for polygraph training that will save time, money, and prevent failure of a student is of paramount importance. In addition to existing regulations concerning the selection of personnel for polygraph training, the following plan is offered. This plan has seven considerations, and where it has been employed, the students, for the most part, have been outstanding. These considerations can greatly determine the success of the student and his future success as a polygraph examiner.

1. First, let us start with the premise that only those with an intense desire for polygraph training, unquestionable integrity and character are considered. There is no place in this field for the cheat or the person who has no sense of values or trust.

2. The second consideration in this selection must be the prospective student's proficiency in interrogation.

(*a*) The student must know the principles of interrogation and be fully experienced in their employment when the polygraph course starts.

(*b*) Practically 95 percent of his work after graduation is interrogation.

3. Thirdly, one should choose his best investigator, because on graduation he will accomplish more work in less time, with outstanding results, than a less apt student.

(*a*) Where the polygraph examiner is the best investigator in the organization, the reduction in time required to thoroughly investigate certain cases will ease the workload for the entire organization and raise the efficiency and morale of all concerned.

(*b*) It is false economy and a definite compromise with efficiency to send a student whose qualifications are mediocre to be trained as a polygraph examiner.

4. The fourth point to consider in making a selection is the education of the prospective student.

(*a*) Performance records clearly show that students who have graduated from high school do better work and learn more rapidly than those whose education terminated in the lower grades, even though they may have

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successfully completed general educational development tests qualifying them for high school diplomas.

(*b*) Students who have had several years of college are at a distinct advantage over high school graduates in studying detection of deception.

5. The fifth item for consideration is to determine the prospective student's aptitude and intelligence. This is most important as it is a controlling factor in the future success of the student.

6. The sixth item to consider is the ability of the student to think in and speak English fluently.

(*a*) Those who cannot think clearly and rapidly in English are greatly handicapped in their classroom work, examinations, and practical training.

(*b*) The student with a disturbing accent and limited vocabulary is at a disadvantage because a subject under test will usually react more to mispronounced words than to relevant questions.

7. The seventh point to consider in the selection is the physical appearance and emotional stability of the prospective student.

(*a*) Those with certain obvious physical defects which are disconcerting to a person being questioned should not be selected, because of the difficulty created during the polygraph examination and subsequent interrogation.

(*b*) Those with any record of emotional instability should never be chosen, because the strain and tension connected with the course of instruction and this type of work can bring about an emotional breakdown.

In summation the ideal polygraph student should be above average intelligence, impressive in appearance, experienced in the field of investigation and interrogation, confident in his ability to do a job, possess an intense desire to specialize as a polygraph examiner, and be of unquestionable integrity.

EXHIBIT 13—ARMY REGULATION 195–11 PERSONNEL CLASSIFICATIONS

3. *Personnel classifications.—a.* The military occupational specialties in the military police criminal investigation career field are—

(1) *Warrant officers.* Criminal investigator (MOS 951A). (See AR 611–112.)

(2) *Enlisted men.*

(*a*) Apprentice criminal investigator (MOS 953.1).

(*b*) Accredited criminal investigator (MOS 953.2).

(*c*) Criminal investigation assistant laboratory technician (MOS 953.3).

b. Classification of warrant officers in MOS 951A is contingent upon their being accredited by The Provost Marshal General. This accreditation will be effected only after all records of the individual, including a character investigation report, have been thoroughly reviewed by The Provost Marshal General.

c. Classification of enlisted men in MOS 953.1 is contingent upon their being accepted by The Provost Marshal General. This acceptance will be effected only after all records of the individual, including a character investigation report, have been thoroughly reviewed by The Provost Marshal General.

d. MOS 953.2 will be awarded only to those enlisted personnel who are qualified in MOS 953.1 or MOS 951.6, and who have been accredited by The Provost Marshal General.

e. MOS 953.3 will be awarded only to those enlisted personnel who are qualified in MOS 953.2, and who have been determined specifically by The Provost Marshal General to be qualified for assignment to criminal investigation laboratory duties.

4. *Prerequisites for acceptance.*—The acceptance of enlisted personnel as apprentice criminal investigators is accomplished by The Provost Marshal General. Except as provided for in paragraph 8, only those persons possessing the following qualifications will be considered for acceptance.

a. United States citizenship.

b. No history of a mental disorder, including pathological personality disorders described in paragraph 6, SR 40–1025–2.

c. Suitable character, loyalty, integrity, reputation, sobriety, discretion, and stability as established by character investigation.

d. No convictions by a civil court for offenses other than minor traffic violations.

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e. No convictions by a general or special courtmartial.
f. Minimum age, 22 years.
g. Physical profile, 222 111 or higher.
h. Normal color vision as prescribed in paragraphs 4–12*a* and 7–15, AR 40–501.
i. Minimum of 2 years of military service in the Army (active Army, Army National Guard, or Army Reserve) of which 12 months of continuous Army military service immediately precedes the date of application.
j. Successful completion of the Criminal Investigation Course at the U.S. Army Military Police School.
k. Standard score of 110 or higher in aptitude area GT.
l. No record of enlistment waiver granted by The Adjutant General for dishonorable, bad conduct, or undesirable discharge.
m. No record of more than 30 days lost under Section 6, Act of 1950. (See MCM 1951, page 453.)
n. Qualification as a military policeman (MOS 951.1) with a minimum of 6 months in this MOS.
o. Minimum grade, E–4.

5. *Prerequisites for accreditation.*—The accreditation of criminal investigators is accomplished by The Provost Marshal General. Except as provided for in paragraph 8, only those persons possessing the following qualifications will be considered for accreditation:

a. Enlisted personnel.

(1) Qualified as an apprentice criminal investigator with a minimum of 12 months in MOS 953.1; *or* qualified as a military policeman (MOS 951.6) with a minimum of 24 months in this MOS, presently serving in enlisted pay grades E–6 or E–7 and possessing the prerequisites listed in paragraph 4*a* through *m*.

(2) High school graduate or equivalent in terms of a State equivalency certificate or appropriate scores in high school level GED test battery as established in AR 621–5. Personnel selected should be encouraged to actively engage in college training in residency or through extension courses in order that they may attain the goal established in *b*(2) below.

b. Warrant officers.

(1) Each of the prerequisites set forth in paragraph 4*a* through *j*.

(2) Two years of college training at an accredited institution (a minimum of 60 semester hours or an advanced standing as a junior), or the equivalency of two years of college as defined in AR 621–5.

6. *Prerequisites for lie detector examiners.*—*a.* Accredited in MOS 951A.
b. Minimum of 1 year's experience as an accredited criminal investigator immediately prior to application for training as a lie detector examiner.
c. Successful completion of the Lie Detector Examiner's Course at the U.S. Army Military Police School.

7. *Prerequisites for laboratory technicians.*—*a.* Accredited in MOS 951A or MOS 953.2.
b. Professionally qualified for assignment to one of the following criminal investigation laboratory fields as determined by The Provost Marshal General: Criminal investigative photography, fingerprint examination, firearms identification, questioned documents examination, and chemical analyses.
c. Successful completion of special technical training at the U.S. Army Criminal Investigation Laboratory, Fort Gordon, Ga., or at a school or training facility recognized by The Provost Marshal General as providing technical training equivalent to that received at the U.S. Army Criminal Investigation Laboratory.

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EXHIBITS 14A–14B—INFORMATION FURNISHED BY THE DEPARTMENT OF THE NAVY

EXHIBIT 14A—LETTER FROM CAPT. C. R. KEAR, JR., U.S. NAVY, DEPUTY CHIEF, TO HON. JOHN E. MOSS, APRIL 27, 1964

DEPARTMENT OF THE NAVY,
OFFICE OF THE SECRETARY,
Washington, D.C., April 27, 1964.

MY DEAR MR. CHAIRMAN: In the recent hearings before your subcommittee, Mr. Reuss, a member of the subcommittee asked a number of questions concerning the 75-percent reliability figures set forth in enclosure (1) and requested the Navy furnish the subcommittee an analysis of cases upon which this percentage figure was based. A statement was made that in those 75 percent of cases in which a determination could be reached, an accuracy rate of 80 percent was obtained.

The pertinent portions of enclosure (1), to which Mr. Reuss had reference, have been outlined in red pencil. The author of enclosure (1) retired in 1956 and died in 1958. His polygraph case folders are no longer available. However, in researching other material, it became apparent that in all probability, the basis for the percentages set forth in enclosure (1) is the manual entitled "Lie Detection and Criminal Interrogation" author, Fred E. Inbau, second edition, dated 1948, pages 76 and 77 therein which are quoted verbatim infra for comparison purposes:

"Since confirmatory or contradictory evidence is not always forthcoming after a deception diagnosis has been made in an actual case, exact figures are unavailable as to the accuracy of lie-detector test results. There is some basis, however, for making an estimate. The following one is based upon the experience of the examiners on the staff of the Scientific Crime Detection Laboratory during the time when the laboratory was a part of Northwestern University, as well as during the period since its acquisition by the Chicago Police Department (totaling approximately 16 years and covering several thousand examinations). This estimate accords to the lie-detector technique an accuracy of approximately 75 percent, and estimate which, however, should not be interpreted as signifying a 25-percent margin of actual error. By the 75-percent estimate is meant that in the examination of 100 subjects, in as many different case investigations, the examiner can make a definite and accurate diagnosis on about 75 or 80 subjects. Of the remaining 20 or 25 subjects the records of approximately 15 or 20 may be too indefinite in their indications to permit a competent and cautious examiner to make a definite diagnosis (which fact may be due to the inconsistency or erratic nature of the subject's responses, or to the subject's 'unresponsive nature' as ascertainable from the results of control testing). The remaining five constitutes the margin of probable error—that is, in about 5 percent of his cases even the most experienced examiner might make an erroneous diagnosis."

A random sampling of 100 cases in which the polygraph was utilized is currently being conducted by the Office of Naval Intelligence and results of this survey will be submitted as soon as completed. We will from this survey of 100 cases, furnish the number in which a determination was made and the number which was indeterminate. We will further indicate the percentage of accuracy as established by other evidence of those cases in which a determination was reached. It will not, of course, be possible for us to identify people to whom we did not give examinations for reasons of health or mental deficiencies, refusal, etc.

Sincerely yours,

C. R. KEAR, JR.,
Captain, U.S. Navy, Deputy Chief.

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EXHIBIT 14B—LETTER FROM CAPT. C. R. KEAR, JR., U.S. NAVY, DEPUTY CHIEF, TO HON. JOHN E. MOSS, APRIL 28, 1964

DEPARTMENT OF THE NAVY,
OFFICE OF THE SECRETARY,
Washington, D.C., April 28, 1964.

MY DEAR MR. CHAIRMAN: This letter is a report to your subcommittee of the random sampling of 100 cases in which the polygraph was utilized, mentioned in our letter of April 27, conducted by the Office of Naval Intelligence. Following are the results of this survey:

A determination was made in 94 of these cases and in 6 cases the tests were considered indeterminate. It was further found that in 79 of the cases in which a determination was made, this determination was fully supported by separate, independent evidence. In the other 21 cases, there is no evidence to support the operators' determinations.

For clarity, the Office of Naval Intelligence position is again stated: It is estimated that out of a possible 100 subjects, 75 are testable; to the other 25 subjects, tests would not be administered for various reasons; e.g., refusal to take the test, a mental or physical condition, etc. Obviously, this latter figure cannot be supported since records are not kept on individuals who are not administered examinations, whatever the reason.

If I can be of further assistance to you in this matter, please do not hesitate to call on me.

Sincerely yours,

C. R. KEAR, JR.,
Captain, U.S. Navy, Deputy Chief.

EXHIBIT 15—MEMORANDUM FROM CYRUS VANCE, DEPUTY SECRETARY OF DEFENSE, TO THE SECRETARIES OF THE ARMY, NAVY, AIR FORCE, ET AL., APRIL 27, 1964

THE DEPUTY SECRETARY OF DEFENSE,
Washington, D.C., April 27, 1964.

Memorandum for:

The Secretary of the Army.
The Secretary of the Navy.
The Secretary of the Air Force.
The Chairman, Joint Chiefs of Staff.
The Director, National Security Agency.

The following instructions are effective immediately throughout the Department of Defense:

No examination with the aid of a polygraph shall be conducted without advising the subject to be interviewed (1) that he has a right under the fifth amendment to the Constitution or, as appropriate, article 31 of the Uniform Code of Military Justice, to refrain from doing anything that may tend to incriminate him; (2) that the polygraph examination will be conducted only with his prior written consent; (3) whether the area in which the polygraph examination is to be conducted contains a two-way mirror or comparable device; and (4) whether the examination will be monitored or recorded, in whole or in part, by any means.

CYRUS VANCE.

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EXHIBIT 16—CHART—POLYGRAPH EXAMINATION, STATEMENT OF CONSENT

POLYGRAPH EXAMINATION
STATEMENT OF CONSENT
(AR 195-10 and AR 381-131)

PLACE	DATE	TIME

STATEMENT OF CONSENT OF *(Name, Grade, & Service No.)*	PLACE OF BIRTH
	DATE OF BIRTH

In the presence of the witness(es) whose signature(s) appear(s) below, Article 31 of the Uniform Code of Military Justice (and the Fifth Amendment to the Constitution of the United States) *(Strike out only if person completing Statement of Consent IS a Member of the Armed Forces)* (has) (have) been read to me by who informed me that he is a polygraph examiner of the United States Army. He has informed me that this statement is being completed in connection with

of which I am (accused) (suspected) *(Strike out if inapplicable)*. He explained to me the nature of the polygraph examination and told me that I cannot be required to submit to such examination without my consent. He explained to me that I do not have to make any statement whatsoever but that any statement I do make may be used as evidence against me in a trial by court-martial or in any other military or judicial proceedings. Understanding my unqualified right to refuse, I, , do hereby, this date, voluntarily and without duress, coercion, unlawful inducement, or promise of reward, submit to a polygraph examination.

WITNESSES	SIGNATURE OF PERSON TO BE TESTED
SIGNATURE, GRADE, AND SERVICE NUMBER	
ORGANIZATION AND/OR ADDRESS	ORGANIZATION AND/OR ADDRESS
SIGNATURE, GRADE, AND SERVICE NUMBER	SIGNATURE OF EXAMINER
ORGANIZATION AND/OR ADDRESS	TYPED NAME AND ORGANIZATION
EXHIBIT NUMBER	

DA FORM 1 JAN 64 2801 REPLACES DA FORM 19-85, 1 OCT 61, WHICH IS OBSOLETE. GPO 872-421

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EXHIBIT 17—MEMORANDUM FROM COL. ROY H. STEELE, GENERAL STAFF, CHIEF, CONGRESSIONAL INVESTIGATIONS DIVISION, OFFICE, CHIEF OF LEGISLATIVE LIAISON, TO BENNY L. KASS, MARCH 26, 1964

DEPARTMENT OF THE ARMY,
OFFICE OF THE SECRETARY OF THE ARMY,
Washington, D.C.

Memorandum for: Mr. Kass, counsel, Subcommittee on Foreign Operations and Government Information, House Committee on Government Operations.
Subject: Information concerning polygraph instruction at the U.S. Army Military Police School, Fort Gordon, Ga.

1. The following information, provided by the Provost Marshal General, is furnished pursuant to your request:

(*a*) Total number of polygraph examiners trained at the U.S. Army Military Police School, Fort Gordon, Ga., during the periods cited is as follows:

Fiscal year 1962 (August 1961 to July 1962), 5 classes	88
Fiscal year 1963 (August 1962 to July 1963), 5 classes	84
Fiscal year 1964 (August 1963 to Mar. 4, 1964), 3 classes	55
Total	227

(*b*) The following Government agencies have sent personnel to the Army for polygraph training:

Fiscal year 1960: Treasury Department	2
Fiscal year 1961:	
Treasury Department	1
Washington, D.C., Police Department	2
Fiscal year 1962: Washington, D.C., Police Department	3
Fiscal year 1963:	
National Security Agency	1
Treasury Department	1
Fiscal year 1964:	
Treasury Department	2
Post Office Department	2

(c) The requirement that personnel selected for polygraph training must have attained a minimum age of 25 years was established in SR 190–30–10, dated October 8, 1951. During the revision and consolidation of CID regulations in 1963 (AR 195–10), dated February 4, 1964; AR 195–11, dated March 8, 1963, the reference to age 25 years as a minimum was dropped through administrative error. Necessary corrective action has been taken. The official policy of the Army as it pertains to the minimum age of 25 years for polygraph training has not changed nor is any change contemplated. The official policy regarding criminal investigative experience of polygraph applicants continues to be as stated in current AR 195–11:

"Minimum of 1 year's experience as an accredited criminal investigator immediately prior to application for training as a polygraph examiner."

(*d*) A random sampling of polygraph examiners attending and completing the polygraph course at the U.S. Army Military Police School during the period 1953–63 showed the youngest attending to be 27 years of age and the oldest to be 46 years of age. The average age of all individuals included in this sampling was 35 years of age. Reference the recently initiated polygraph transition course, only two classes have been conducted to date; however, records show the average age of individuals attending this transition course to be 43 years of age.

2. Enclosed are 12 copies of each of the following publications related to the polygraph and the polygraph training program of the Department of the Army:

(*a*) SR 190–30–10, Operation of Lie Detecting Set AN/USS–2( ), dated October 8, 1951.

(*b*) AR 195–21, Utilization of Lie Detecting Set AN/USS–2( ), dated May 31, 1957, as changed.

(*c*) AR 195–10, Military Police Criminal Investigative Activities, dated February 4, 1964, with associated forms.

(*d*) AR 195–11, Accreditation of Military Police Criminal Investigators, dated March 8, 1963.

(*e*) TB PMG 22, Lie Detector, dated February 10, 1955.

(*f*) FM 19–20, Military Police Investigations, dated March 20, 1961.

(*g*) TM 11–5538A, Recording Lie Detector AN/USS–2C, dated March 28, 1957, as changed.

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(*h*) Program of Instruction for 19–M–F3, Polygraph Course, approved December 6, 1963, U.S. Army Military Police School.

(*i*) Program of Instruction for 19–N–F15, Polygraph Transition Course, approved December 6, 1963, U.S. Army Military Police School.

For the Chief of Legislative Liaison:

ROY H. STEELE,
Colonel, General Staff, Chief, Congressional Investigations Division, Office, Chief of Legislative Liaison.

EXHIBIT 18—LETTER AND MEMORANDUM FROM COL. ROY H. STEELE, CHIEF, CONGRESSIONAL INVESTIGATIONS DIVISION, OFFICE, CHIEF OF LEGISLATIVE LIAISON, TO SAMUEL J. ARCHIBALD, APRIL 28, 1964

DEPARTMENT OF THE ARMY,
OFFICE OF THE SECRETARY OF THE ARMY,
Washington, D.C.

Mr. SAMUEL J. ARCHIBALD,
Staff Administrator, Subcommittee on Foreign Operations and Government Information, Committee on Government Operations, House of Representatives.

DEAR MR. ARCHIBALD: Per your request for unclassified information concerning the AP release of February 28, 1964, and the Jim G. Lucas story of March 30, 1964, relating to the use of polygraphs in Vietnam, the Department of the Army has conferred with the Department of Defense, and has received authority to release the attached unclassified fact sheet to the committee.

I trust this information will be of assistance to you.

Sincerely,

ROY H. STEELE,
Colonel, General Staff, Chief, Congressional Investigations Division, Office, Chief of Legislative Liaison.

Memorandum for Mr. Samuel J. Archibald, staff administrator, Subcommittee on Foreign Operations and Government Information, Committee on Government Operations, House of Representatives.

Subject: Use of lie detectors in Vietnam, AP release of February 28, 1964, and the Jim Lucas story of March 30, 1964.

1. The following information is furnished with respect to February 28, 1964, release:

(*a*) The Army spokesman in the subject news release was the Military Advisory Command, Vietnam provost marshal.

(*b*) The text of the AP release is partly accurate in that a polygraph was used to check suspected Vietcong agents. The polygraph used is the standard Army, spring and battery operated polygraph, AN/USS–2B (described in U.S. Army Technical Manual 11–5538). The AP article is inaccurate in implying that a pocket-size transistor polygraph was the machine used. The MACV provost marshal displayed to the reporter a miniature polygraph manufactured by Takaikiki Co., Ltd., Japan, stating: "We hope to test this machine in the field later. I believe it will work." This Japanese machine has only the galvanic reactor, one of three reactors used with the Army's AN/USS–2B model. No Army-sponsored tests of the Japanese model have been authorized or conducted.

(*c*) The Army has no program underway to develop a pocket-size transistor polygraph.

(*d*) The operator conducting the test was trained at the U.S. Army Military Police School at Fort Gordon, Ga., and attended the prescribed 12-week course of instruction for polygraph operators. In addition to his school training he has had considerable field experience.

2. With respect to the Jim G. Lucas story of March 30, 1964, the following data is submitted:

(*a*) The U.S. Army has employed a total of eight polygraph instruments in Vietnam. Four of the instruments are Stoelting models and four are Keeler models.

(*b*) There are five qualified Army polygraph examiners in Vietnam.

ROY H. STEELE,
Colonel, General Staff, Chief, Congressional Investigations Division, Office, Chief of Legislative Liaison.

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USE OF POLYGRAPHS AS "LIE DETECTORS" BY THE FEDERAL GOVERNMENT

(Part 3—Panel Discussion With Scientists)

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE

COMMITTEE ON

GOVERNMENT OPERATIONS

HOUSE OF REPRESENTATIVES

EIGHTY-EIGHTH CONGRESS

SECOND SESSION

APRIL 29 AND 30, 1964

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USE OF POLYGRAPHS AS "LIE DETECTORS" IN THE FEDERAL GOVERNMENT

(Part 3—Panel Discussion With Scientists)

WEDNESDAY, APRIL 29, 1964

HOUSE OF REPRESENTATIVES,
FOREIGN OPERATIONS AND
GOVERNMENT INFORMATION SUBCOMMITTEE
OF THE COMMITTEE ON GOVERNMENT OPERATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., pursuant to call, in room 304, Cannon Office Building, Hon. John E. Moss (chairman of the subcommittee) presiding.

Present: Representatives John E. Moss, Porter Hardy, Jr., Henry S. Reuss, John S. Monagan, George Meader, Robert P. Griffin, and Ogden R. Reid.

Staff members present: Samuel J. Archibald, staff administrator; Jack Matteson, chief investigator; Benny L. Kass, subcommittee counsel, and Marvin G. Weinbaum, staff investigator.

Mr. Moss. The subcommittee will be in order.

This is a continuation of the subcommittee's inquiry into the use of polygraphs—so-called lie detectors—by the Federal Government.

We have heard testimony from non-Government experts in the field of lie detection and from Army, Navy, and Air Force witnesses who are familiar with the use of the polygraph in Government. Additional Government witnesses will be heard at a later date.

Testimony so far reveals several significant areas of interest to the subcommittee. These include the training and qualifications of polygraph examiners, the reliability and accuracy of the instrument in measuring emotions, and the widespread use of the instrument by the Government for criminal investigations and in certain security agencies for preemployment examinations.

In reviewing the testimony on training and qualifications of Federal polygraph examiners there is strong evidence of a complete lack of standardization in setting minimum requirements. There is a wide variation among Federal agencies in the requirements for classroom polygraph training—ranging from 5 days in some instances to 7 weeks in others. The hearing record shows that the experts sharply disagree on desirable requirements for polygraph examiners.

The type of polygraph generally in use by the Federal Government records physiological functions in the subject being tested. The graphs depict pulse and blood pressure, respiration, and minor changes in skin dampening. It is stated that these physiological changes are

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generated by emotional reactions. By interpretation of these recordings the examiner claims to be able to determine the guilt, innocence, or moral character of the person being examined. So far there is no adequate showing in the hearing record to indicate that the conclusions reached by the polygraph examiner are based on scientific fact. To further explore this problem, the subcommittee today has convened a panel of specialists in the field of psychiatry and psychology who have done research in the use of polygraphs. They are:

Dr. John I. Lacey, chairman of the department of psychophysiology-neurophysiology, Fels Research Institute, and professor of psychophysiology, Antioch College, Yellow Springs, Ohio;

Dr. H. B. Dearman, psychiatrist, Johnson City, Tenn.;

Dr. Joseph F. Kubis, professor, department of psychology, Fordham University; and

Dr. Martin T. Orne, senior research psychiatrist, Massachusetts Mental Health Center, and associate in psychiatry, Harvard Medical School.

Gentlemen, I wonder if you would stand and be sworn?

Do each of you solemnly swear the testimony you are about to give this subcommittee will be the truth, the whole truth, and nothing but the truth, so help you God?

Dr. LACEY. I do.

Dr. DEARMAN. I do.

Dr. KUBIS. I do.

Dr. ORNE. I do.

Mr. Moss. Will you identify yourselves for the record?

Dr. LACEY. I am John I. Lacey.

Dr. KUBIS. I am Dr. Joseph Kubis.

Dr. ORNE. Martin Orne.

Dr. DEARMAN. Dr. H. B. Dearman.

TESTIMONY OF DR. JOHN I. LACEY, CHAIRMAN, DEPARTMENT OF PSYCHOPHYSIOLOGY-NEUROPHYSIOLOGY, FELS RESEARCH INSTITUTE, AND PROFESSOR OF PSYCHOPHYSIOLOGY, ANTIOCH COLLEGE, YELLOW SPRINGS, OHIO; DR. H. B. DEARMAN, PSYCHIATRIST, JOHNSON CITY, TENN.; DR. JOSEPH F. KUBIS, PROFESSOR, DEPARTMENT OF PSYCHOLOGY, FORDHAM UNIVERSITY; DR. MARTIN T. ORNE, SENIOR RESEARCH PSYCHIATRIST, MASSACHUSETTS MENTAL HEALTH CENTER, AND ASSOCIATE IN PSYCHIATRY, HARVARD MEDICAL SCHOOL

Mr. Moss. Do any of you gentlemen have a statement you would like to make at this time? If not, the Chair recognizes Mr. Kass, counsel for the subcommittee.

Mr. KASS. Dr. Lacey, could we start with you? Could you discuss the various measurements which are recorded by the polygraph? What is the polygraph and particularly what are the physical responses measured when the instrument is used as a lie detector?

Dr. LACEY. The word "polygraph" simply refers to any assemblage of instrumentation which enables the simultaneous and continuous measurement of more than one physiological variable. The word does not apply primarily to the so-called lie detector apparatus. They have simply preempted the word. If one measures 12 channels of brain

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waves and one blood pressure channel by means of an indwelling catheter, one is using a polygraph.

The variety of physiological measures which can be measured is very large. Some of the procedures are innocuous and relatively painless. Some are less innocuous and more painful. Also, one can choose various methods of display. The action of the heart, for example, can be exhibited either as the familiar electrocardiogram or the electrical signals deriving from the action of the heart can be processed by a piece of electronic machinery. One can display the envelope, cycle by cycle, of heart rates or heart period, and so on.

The so-called lie detector polygraph is, as I understand it, a very simple and for the most part a fairly crude piece of instrumentation.

Here I do want to make a statement.

I am not a lie detector expert. My experience in the field of lie detection is very minimal indeed. I have read some of the literature, including Dr. Kubis' latest very scholarly contribution to the field. I have used the lie detector technique as a simple introduction, to elementary students in psychophysiology, to the problem of what is know as autonomic activation.

I have, however, done polygraphy in the sense that I have been engaged for many years in the measurement of physiological responses in an attempt to understand their significance for behavior.

So, anything that I say about the lie detector machine or lie detectors will have to be checked with people more expert in the field than I. But, as I understand from descriptions I have seen, and on the basis of my early graduate school days when I used the Keeler polygraph, these are relatively simple, crude instruments. There seems to have been no change, Dr. Kubis, in instrumentation. There has been no attempt to take advantage of the many, many things we have learned in the past two decades, let us say, about the recording of physiological responses, the artifacts, biophysical and electronic, as well as those engendered by the nature of the examiner-examinee interaction.

There has been no attempt to take advantage of new methods of display, new methods of computation.

As I understand it, lie detector operators still diagnose the record by visual scanning of the record.

I may say I am convinced this is an impossible task. But Dr. Kubis has recently shown, with well-trained individuals using rating scales in a very careful way that it can be done.

Does that answer your question, Mr. Kass?

Mr. KASS. Dr. Kubis, what does the polygraph used in the commercial practice as a lie detector measure?

Dr. KUBIS. Usually lie detectors in commercial practice measure three responses. They attempt to monitor some aspects of the cardiovascular response; namely, blood pressure or pulse, or a combination of both. They attempt to monitor respiration and now, in the last 15 years or so, the psychogalvanic response.

These are the three indexes that are used fairly widely in the commercial lie detector.

I may add that, though three indexes are obtained, my experience in talking to men who have used lie detectors is that these men have a preference for one or the other in their actual interpretation. Even though they may have three signals some may feel more comfortable

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in using blood pressure. Others may feel more comfortable in using respiration responses. And still others may prefer to use the galvanic responses.

As Dr. Lacey mentions, it seems to be almost an impossible task to scan all three visually and get objective criteria in that one glance at the record.

Mr. KASS. Dr. Kubis, is there a correlation or intercorrelation, for example, when an individual lies, between his blood pressure, his pulse, his respiration, and his galvanic skin response?

Dr. KUBIS. Perhaps you mean whether there is always a positive correlation. There will always be some type of relationship. Even though we may not observe any, looking at these things visually, there undoubtedly are relationships within the recording responses. But those may not be constant from individual to individual. Some of these men have acquired a great facility in using these instruments and presumably, from the percentages that they quote, they seem to have been able to identify people who have told something that was contrary to what they believed.

I may mention here that lie detectors don't prove fact. Lie detectors are merely belief verifiers if they are used properly; namely, they indicate, if it is accurately done, whether the man believes what he is saying. This does not indicate that what he says is a fact.

We have examined people in mental hospitals. If the patient said he was Napoleon, and if he believed this, the lie detector response indicated that he was telling the truth. All that the lie detector showed is that he believed what he was saying.

Dr. LACEY. The point is well taken. There is, however, another point: that is, the meaning of the physiological disturbance. We have to be very careful in choosing our words. Physiological disturbance can be recorded when a symbolic stimulus is administered to an individual; say, a word, scene, image, description. To the best of our knowledge and ability, many times we cannot elicit from the subject or patient a verbal description of what underlies the disturbance.

Let us use a word, a phrase, which will carry meaning but which, itself, needs a lot of talking about—"unconscious anxiety" can be recorded in the cardiovascular system or in an electrodermal response. So not only does the polygraph record what the subject believes but it records what he unconsciously feels.

Mr. KASS. Dr. Orne, what is a lie? I think you are qualified in this panel both as a psychiatrist and as a psychologist. Can you, from your experience, define what is a lie?

Dr. ORNE. That is a good question. I don't know how to define a lie. As a lawyer you could define the term better than I. It is not a term which has been carefully defined by scientists. What a lie is is a matter of point of view which varies with individuals; however, it may not be necessary to define this concept because the so-called lie detector does not actually detect "lies."

Mr. KASS. Then what does the lie detector or the lie detector operator have to do?

Dr. ORNE. I think this is perhaps a more meaningful question.

What the polygraph is used for in so-called lie detection, is to find out whether there is an undue physiological response at some point which is usually associated with an attempt to conceal the truth.

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Now, there are two different models which you can look at. I think that the one used most commonly in commercial lie detection is that you are trying to find out what information specifically this individual has which will elicit this kind of response. You might call it the guilty information problem. You might ask the person, "Are you lying?" And you are then asking in his terms, not in scientific terms, whether or not he feels this is a lie, and hoping to elicit a response. This is the most general kind of question.

You might ask him, "Did you take something?" or "Did you murder so and so?" and so on, attempting to see whether or not a specific item of information, which he is assumed to have evokes a response.

There is an entirely different way of looking at it which is much easier, I think, from a scientific viewpoint. This is whether he in fact has certain information where you are trying to identify, not whether he is telling the truth or not, but rather trying to determine whether a given set of data is meaningful to him.

Now, this is quite a different kind of problem. It is one which is perhaps much more amenable to investigation and one where I think most of us would agree that it is possible to do this.

I don't know whether I am being clear in this distinction. If you, for example, had a set of facts which were important to you, your physiologic responses to these stimuli should be different from your responses to a set of verbal stimuli which were not significant. What you would be determining is not whether the individual lies but whether the data which you are presenting to him is relevant or not relevant to him; you are determining not whether he is telling the truth but whether a given set of information has importance to him.

Mr. KASS. How would you, if you were a polygraph examiner, or if you were in an experimental situation trying to determine whether this person has this fact, how would you determine this by using the polygraph? Or could you determine this by using the polygraph?

Dr. ORNE. I think you have to qualify the term. I think you could assign a probability value to whether an individual does or does not have a given item of information. The more items of information you are dealing with, the better the odds are of a very high probability. For example, if I ask you a question which has only two alternatives: "Last night did you go to sleep soon or did you stay awake a long time?" Let us assume that you responded that you stayed awake a long time. First of all, there would only be a 50–50 probability involved here, and the chance of error would be quite high. If I asked you a question with, let us say, five alternatives, this would cut down the possible chance fluctuation. If I asked you 10 questions with 5 possibilities each, we could begin to be a lot more precise and you could increase the probability of knowing what you are doing.

Does that answer your question?

Mr. KASS. What if you were interested in just one fact: "Did you go to sleep last night?" without the alternative? Would you be able to get any sort of reaction response in determination, correlation—whatever word you want to use—from the polygraph charts?

Dr. ORNE. The less data you are looking for, the more difficult it is to assign a very high probability to the data that you are getting, because you have only a very restricted range of things that you have to make a decision between.

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Now, if you say, "Can you determine it?"—the answer is only in terms of probabilities. You can assign a probability value and that is all you can do.

Mr. KASS. In your studies you have assigned probability values to your experiments. Could you comment on the value that you placed on them?

Dr. ORNE. Well, I think perhaps one of the problems, if I can explain it a little bit more theoretically it might be easier to see—you are asking, and the statements of lie detector people are usually phrased in terms of "this person is guilty," or "this person is innocent," with a very small group of individuals about which no determination can be made. The lie detection people attempt to come to a decision, that is, guilt or innocence. As such, you have difficulties. A perfect categorization with imperfect data is impossible. Therefore you do run into the problem of obtaining possibly false positives or false negatives.

Mr. KASS. Could you explain for myself and for the record what you mean by a false positive and what you mean by a false negative?

Dr. ORNE. There are two types of errors. A false positive is when you say a person is guilty and he is in fact innocent. A false negative is if you decide a person is innocent and he is in fact guilty. It would be a false negative because you classified him in the negative category and he is in fact in the positive one, and visa versa.

You can switch the terms around if you like.

Dr. LACEY. Perhaps it should be made clear at this point that these are not symmetrical errors. You can have a test which has a high incidence of false negatives and few false positives and have a test that has a high incidence of false positives and few false negatives. Obviously, one's decision to utilize the two in a practical situation depends very much upon how well one can specify the proportion of these two different kinds of errors in a specific situation. The proportions of false decisions are probably situation bound.

Dr. ORNE. Precisely; this is true in many instances with the same test, not only with different tests. For example, let's assume we have a given set of 100 tests for the detection of deception where, for experimental reasons, it was arranged to have 50 people who were, in fact, guilty and 50 people who were, in fact, innocent so that you have 50 people who should be classified as guilty and 50 who should be classified as innocent and you are trying to clarify which are which. In other words, trying to separate the sheep from the goats. You have a test which is, let us say, 80 percent accurate; you can set your criteria to maximize the number of correct determinations of both guilt and inncence. As a result, with this theoretical case, you would end up with 40 people classified correctly in each group with 20 percent false positives and 20 percent false negatives. In other words, 10 guilty people who are classified erroneously as innocent and 10 innocent people who are classified erroneously as guilty.

However, you can choose a cutoff point in such a fashion that you can be reasonably certain no one will be called guilty who is in fact innocent. This would mean, however, that you would then classify the people in such a way that you might call 80 people innocent and theis would then includes all the 50 who are, in fact, innocent but also 30 who, in fact, guilty. By eliminating all the false positives with an imperefct technique you have to accept a great many more false negatives. In this case, by deciding to be correct in all cases where

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you call someone guilty, you will be wrong 60 percent of the time when you call someone innocent. But you could pretty well guarantee that the 20 that you called guilty were in fact guilty. In other words, it it entirely possible to choose a cutoff point which eliminates false positives at the expense of increasing your error rate with false negatives. Obviously you can do it the other way around also by reversing the position of the cutoff point. This choice is an administrative rather than a scientific decision. You are working with the same data but you can choose your cutoff point in such a way as to pretty well guarantee that you will lose none of the guilty ones or that you will lose none of the innocent, but you can't do both.

For some purposes, such as a sensitive security position, you might be willing to accept a large number of false positives in order to make certain that you will pretty well eliminate the possibility of false negatives. Conversely, for criminal investigation purposes, you might wish to set the criterion in such a way that you would rather be certain of eliminating false positives and be willing to accept a high error rate with false negatives.

It is difficult to answer how accurate the lie detector is in terms of the probabilities of falsely diagnosing guilt or falsely diagnosing innocence. Given an accuracy of say, 50 percent in a balanced situation designed to maximize correct answers, you can choose to set your cutoff point in such a way as to minimize either error.

I would like to separate the scientific issue of accuracy from the almost administrative decision of what you will do with the data. This is much the same thing as college board data predicting college performance. A very high score on the college boards predicts reasonably accurately that an individual will do well in college; however, a low college board score does not predict at all well that an individual will do badly. This information is available to the dean who makes the decision. If he has to choose a very few students from a large number of applicants, he may well decide to take only students with good college-board scores, knowing full well that he may be eliminating some very good potential students. By so doing, he will be reasonably certain of eliminating false positives at the cost of making a high proportion of false negatives decisions. By the same token, under different circumstances with fewer applicants, the dean may feel it is essential not to lose any potentially good students and in that case, of necessity, he will choose a different cutoff point therefore also admitting more students who are potentially unable to do the work. All the educational testing services can do in this instance is to obtain the data and report the findings to the dean. The administrative decision is a separate issue. It may be useful to look at lie detection data in a similar way.

Mr. KASS. Dr. Kubis, you have done studies in polygraph work as lie detection; is this correct?

Dr. KUBIS. That is right.

Mr. KASS. How scientific is this method?

Dr. KUBIS. Well, if you would consider method, you would have to consider the instrument, the individual, and his operation of the instrument. Now, in terms of instrumentation, as Dr. Lacey has pointed out, the field has not progressed as it should have from a scientific point of view. There have been many opportunities for it

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to progress. There may have been a great investment of money in the types of instruments that have been manufactured, and those instruments are still in operation. There have been some minor improvements but they are not very great.

In terms of some of my own research, it seems conceivable that people now are relatively knowledgeable about these various procedures and can, as it were, fool the lie detector operator. They don't fool the machine. The machine only records what it records but they may fool the lie detector operator who is interpreting the curves that are generated by the machine. In other words, people—once they know what is being recorded, especially if they are guilty, or if they are playing a game as in experimentation—will try to find methods of beating the procedure—not the machine—beating the procedure which involves the interpretation of the examiner.

In this particular case, we have a machine which only records the physiological responses and an individual who tries to interpret the recordings of the machine.

When you ask how scientific is this procedure, it would seem that in terms of the exacting criteria of science it is not so very scientific. These men are practically oriented and are trying to make practical decisions. They have a number of hunches, a number of criteria or ways of interpreting data which are peculiar to them. And having had some success, which was probably above chance, they are acting according to this procedure.

Now, if they were scientific—and it depends on what we mean by scientific—they might try to put all of this data into some numerical form. They would then try to integrate these sets of numbers, to get a single number. Then they would try to compare this single number with a number that they feel is a critical point. At that point they should make the decision whether he—the suspect—is or is not saying what he believes. I am trying to get rid of the notions, as Dr. Orne has been trying, of guilt or innocence. I think it is a matter of verification of what the suspect knows or what he believes he knows.

This is the type of approach which should be made.

Mr. KASS. Dr. Kubis, to your knowledge, and you have done some work with the Federal Government, has the Federal Government ever conducted any such studies to determine the scientific aspect of polygraph as a lie detector?

Dr. KUBIS. The study that I had been working on was precisely along these lines. It was attempting to find out something about operators, how relatively good and relatively poor operators can interpret records. It was attempting to find how accurate the various indexes are in discriminating the person who is "lying" in an experimental situation. Finally it was an attempt to see whether some integration of numerical results could be obtained to determine certain invariant factors that might remain constant from person to person. Only then would you have an objective index that could be used uniformly for the entire population of possible candidates; otherwise, you are faced with the situation of setting up norms for each individual. In the ordinary lie detection situation, the men in the field may not have enough time to develop a normative base for evaluating the performance of suspects.

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Dr. Lacey has been working with this problem for a number of years and he knows how difficult it is to set up an individual norm for each person. The men in the field have to do this by intuition, by some feeling that they have of working with these machines for a number of years.

Somehow or other, if we can accept the figures they give, they are coming up with accuracies that are greater than chance. How trustworthy these numbers are is another problem. I have to stick with the numbers they publish.

Mr. KASS. This study you are talking about, is that entitled "Studies in Lie Detection, Computer Feasibility Considerations, Fordham University, New York, N.Y., Air Force Project No. 5534"?

Dr. KUBIS. That is right.

Mr. KASS. What were your conclusions from this study?

Dr. KUBIS. That in the absence of any invariant relations the application of a computer to get real time decisions was not a feasible procedure at the present time because there were no uniform criteria of what we may call guilt or innocence, nonbelief verification or belief verification.

Mr. KASS. You say there is no uniform criteria at this time and, therefore, we could not do computer feasibility studies?

Dr. KUBIS. Computer feasibility studies can be done. Computer feasibility studies are studies to see whether computers can be feasible. Feasible for what? There are two types of objectives: Whether they are feasible for really doing the work of the lie detector operator or whether they are feasible for measuring physiologic responses. It is fairly clear they are feasible for measuring physiologic responses.

Mr. KASS. Haven't the studies that were performed avoided the basic question of how scientific the polygraph is as a lie detector but related more to expanding the polygraph itself?

Dr. KUBIS. No; once you ask the question of how feasible it is to apply a computer, then you are getting to the heart of a very important scientific point. We all know that the human individual in judging visually complex patterns is not such a good judge of these patterns—not such a good evaluator.

We also know that if a computer is properly applied that it can measure responses to a much finer degree of precision than the human eye can do under these circumstances, especially in a short period of time. This is very basic.

Technically, this raises another important point. If the human individual is subjectively oriented, he may be biased by his emotional condition, and he may make judgments of error which are due to his condition and not to the tracings. It would be much better to use an objective instrument to eliminate the individual variability among examiners. Not that I am for it at this time, but if there is a better method of measuring we should use that method.

Mr. HARDY. Could I ask a question on that?

Mr. MOSS. Certainly.

Mr. HARDY. Do I understand, Doctor, what you are saying is that a computer can be relied on to make an accurate interpretation of that measurement?

Dr. KUBIS. That is right.

Mr. KASS. Dr. Kubis, are you also saying that the computer could possibly replace the examiner in some situations?

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Dr. KUBIS. I should not like to put the lie detection "profession" out of business. That is not my objective. It is purely a scientific problem of measurement that I was interested in. In point of fact, if the criteria are put into the machine; that is, the numbers are put into the machine so that the machine will discriminate what numbers it accepts and what numbers it rejects, even in a crude way the machine can do as good a job as the man who has a record in front of him and has to evaluate it visually.

Mr. KASS. We have been talking about the polygraph and I think it was Dr. Lacey who mentioned that it measures autonomic responses.

Dr. LACEY. Also skeletal responses.

Mr. KASS. What do you mean?

Dr. LACEY. Skeletal muscles are the muscles under voluntary control. Polygraph simply means many writeouts.

Mr. KASS. How many possible writeouts, charts, pens, whatever you call it, do you use in your laboratories?

Dr. LACEY. I have the capability in the largest of our 5 experimental suites of measuring 19 channels of information.

Mr. KASS. Does that mean that you can measure 19 different autonomic and skeletal responses?

Dr. LACEY. And brain responses.

Mr. KASS. And brain responses?

Dr. LACEY. That is correct.

Mr. KASS. Dr. Dearman, I think you were talking to me earlier about the autonomic nervous system. Could you define it for us?

Dr. DEARMAN. That is what we call the vegetative nervous system, the automatic nervous system controls glands of internal secretion, heart, blood pressure, intestines, urinary bladder. It controls all those things which automatically take place without our knowledge, so to speak. We cannot make our heart beat faster or slower. If the situation arises, the automatic nervous system will make it beat fast or slow.

Mr. KASS. What type of responses come out of the automatic nervous system?

Dr. DEARMAN. It is divided in two parts, the sympathetic part and parasympathetic part.

The sympathetic part of the nervous system is the excitatory part. The parasympathetic is the inhibitor. In other words, it is a balanced system.

On the polygraph, you record the automatic response to blood pressure, pulse, skin resistance.

Mr. KASS. Do blood pressure, pulse, respiration, galvanic skin response fall under the autonomic nervous system?

Dr. DEARMAN. Yes.

Dr. LACEY. Respiration partially. One can control it in various aspects.

Dr. DEARMAN. You can control it for a length of time.

Dr. ORNE. There is one thing which I think should be clarified. As you described the autonomic nervous system one gets a feeling it is an automatic nervous system. I think it should be clear that many of these parameters which we are discussing when we are talking about their measurement are not necessarily involuntary. For example, the psychogalvanic skin response, which is in essence a sweat-

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ing response, is an autonomic response, and many people believe it is therefore not subject to any volitional control. This is not the case.

If you tell the individual, "Please give me a big GSR response. Please sweat when I say 'now,' " he usually will be able to produce a beautiful GSR response at will.

If you tell a subject, "I would like you now to increase your heartbeat, just think of yourself being afraid when I say 'now,' " and then say "All right, start now," his heartbeat may go from 80 to 110 within a beat. When you say "stop," it will drop within a beat back to 80.

We have done a fair amount of work on what you might call the voluntary control of the read-out. This has nothing to do with lie detection. It is basic psychophysiological work.

I am sure Dr. Lacey will confirm this kind of phenomenon, that the control, the voluntary volitional control of these parameters, is considerably greater than we normally give them credit for.

Dr. DEARMAN. I can't quite agree with that for the simple reason that if you cut the sympathetic nerve to the heart you get a slowing of the heartbeat. When Dr. Orne says you tell a man to think about something, being afraid, certainly it is going to speed up. It is going to speed up automatically because this is a stress situation. In other words, if he thinks of the death of a family member, this is the thing that causes the autonomic nervous system to kick up. In other words, without an emotion, it wouldn't work if you could be entirely objective.

Dr. LACEY. What wouldn't work?

Dr. DEARMAN. You could be entirely objective about something and say, being scared and knowing about scaring, I don't think you would get an autonomic response because, as Cannon said, the autonomic nervous system is the nervous system used for the "fight or flight" response. Just like a football player getting ready for the kickoff, he is very nervous until this happens. When he kicks the ball, then he settles down.

Dr. LACEY. I think at this moment in time you have opened a Pandora's box. You are at the point of considerable disagreement among those engaged in the daily study of the problem of the relationship of autonomic functions to the central nervous system, of what the autonomic responses are there for. The Cannon theory of fight or flight, I am afraid, Dr. Dearman, is not one that holds up in daily laboratory investigation. I think most people investigating this area today would not feel that this formulation even begins to encompass what we see. It is perfectly possible, for example, to administer a word association test in which as carefully as possible one eliminates all words with "emotional" connotation: success, mother, love, feces, and so on. Eliminate all these words, administer the words calling for the first association that comes to mind and one will elicit, for example, beautiful GSR's. If one tries to find what this correlates with, one can find as did Berlyne, for example——

Mr. KASS. Excuse me, Dr. Lacey, as did——

Dr. LACEY. Berlyne, B-e-r-l-y-n-e, University of Toronto. As did Berlyne, that the magnitude of the GSR elicited depended upon what is known as the response uncertainty of the word. Words which in our culture evoke a multiplicity of responses, elicit larger GSR's than words which in our culture do not evoke a multiplicity of association.

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If I give you a word association test and I say "black," you will say "white." That is an extremely popular response; it will not be accompanied by a large GSR.

Dr. DEARMAN. It might be if I had some sheer animosity toward a colored person.

Dr. LACEY. That is correct.

Dr. DEARMAN. If you say something is irrelevant or relevant, you have to say irrevelant or relevant to whom? Do I drink coffee? This guy got a beating every time he drank coffee. Well, anybody would get a response to that.

This thing has meaning to a person that we don't know.

Dr. LACEY. That is correct. I am giving you a group result. By the very fact that it is a group result, it bears with it a little more certainty than the study of any single case.

The single-case study always elicits dramatic leads in hypothesis for further test.

All I am saying is, as you can already see, we are now in an area of disagreement. I think the committee had better be aware that there is disagreement.

Mr. KASS. You say we have opened up a Pandora's box of disagreement. Isn't this same disagreement possible to come up practically in the polygraph situation?

Dr. LACEY. Absolutely, I would think so.

Dr. ORNE. Just one thing. I don't think we are really disagreeing this much because there is an empirical basis for answering the question. I am not talking about data off the top of my head; the data is available, it is public. I refer you to a paper from our laboratory in the Journal of Psychosomatic Medicine which reported the study I am talking about. What we were doing specifically was comparing the effect of hypnotically induced emotions on heart rate, GSR, respiration, and so forth, with the change individuals could evoke at will. The remarkable finding was the extent of autonomic changes which individuals could produce without any special procedure.

I don't think that it matters, and I am perfectly willing to take this as a scientific controversy, what the intervening variable is; namely, how you do it. From the point of view of this committee, it is relevant that you can do it and it is not automatic. In other words, if I ask you to please be afraid, you can make your own heart beat more rapidly within two beats and most normal persons have this ability, I would therefore say for our purposes we may view it as a fairly voluntary response and it would be giving the wrong idea to present it as an involuntary response even though it may be mediated by recalling past experience.

Since we all have this ability at all times, we may consider the ability of the individual to produce a GSR response at will, to inhibit respiration at will, to increase his heart beat at will as within the repertoire of the normal intact human being.

Dr. LACEY. This is one of the areas of disagreement I am referring to, that the old line autonomic nervous system is entirely automatic. I just think it is so clear today that it is not. Dr. Orne has contributed a great deal of information in this field in studies of what he calls "The Demand Characteristics of the Experiment." It is so clear that whatever the mediating process, as Dr. Orne says, the organism has

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methods at its disposal for augmenting or inhibiting a variety of physiologic responses.

Mr. KASS. Dr. Lacey, if I understand you correctly—and I am not a scientist—you are saying that in the individual, some individuals, or within the same individual, the autonomic nervous system may be automatic and at other times not?

Dr. LACEY. No; the word "autonomic" is something of a misnomer. It arose because of certain structural peculiarities of the nervous system seen when one opens up, say, a dog or cat or man, and looks to see how the nerves are distributed. There are certain definite structural and functional peculiarities to that branch of the nervous system which has come to be given a separate chapter discussion in the textbooks on physiology. This is what we mean by the autonomic nervous system.

Today, at the frontiers of psychophysiology and neurophysiology far less attention is being paid to these structural and functional peculiarities and much more to the functional similarities and to the interconnections between the central nervous system and the autonomic nervous system.

All autonomic functions with which I am familiar are integrated at all levels of the nervous system. You can elicit them in an anesthetized animal from the cortex, subcortex, from the brain stem.

These are all interconnected and these interconnections provide the physical basis for the kind of phenomenon that Dr. Orne has presented in his work so very convincingly.

Let me give you an extremely simply example to show you how sensitive these responses can be to—I will use Dr. Orne's phrase, I like it—to "the demand characteristics of the experiment."

Any new intrusion in the environment, any new stimulus, will evoke quite a few physiologic responses. Our Russian colleagues have it, for example, that a novel stimulus will evoke vasoconstriction in the digit, vasodilation in the temple and GSR. This is one of their criteria for what they call the orienting reflex. Repetition of this stimulus, if no particular meaning is given to it and if it does not change, if the organism has nothing to do with that stimulus, repetition of that stimulus will rapidly result in a diminution, indeed a disappearance of these physiological aspects of the orienting reflex.

Now, all one has to do is to tell the subject, "Would you count these lights as they appear and at the end of 5 minutes I will ask you to tell me how many there were." The organism is simply keeping serial count. He is saying, "That is the first light. That is the second light. That is the third light. It has come on." This will delay the adaptation of the orienting response for very long periods of time.

At the end of 2 hours in my laboratory, for example, simply by requiring a subject to keep track of the number of times a very bright light has been flashed in his eye, a certain brain response known as alpha block, which adapts out very rapidly typically, at the end of 2 hours it is still there just by requiring a modest change in the relationship of the organism to his environment.

What do you make of this, automatic or nonautomatic?

Mr. KASS. What do you believe we make of this in a polygraph situation used as lie detector?

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Dr. LACEY. I think what we make of it is something like this. I will have to make a little speech.

Dr. DEARMAN. Could I ask you a question?

Dr. LACEY. Yes.

Dr. DEARMAN. How do you know that the word "count" does not have meaning to this individual?

Dr. LACEY. How do I know that the word what?

Dr. DEARMAN. Count. How do you know the word "count" does not have a meaning to this individual?

Dr. LACEY. I think I would have to say How do you account for the fact that the word "count" has the same meaning for all individuals in the experiment?

Dr. DEARMAN. In his learning how to count, mother has beat the dickens out of the kid, several times; it would have a meaning for him.

Dr. ORNE. In Dr. Lacey's study, it does not matter whether the mother beat the dickens out of the kid. He has run lots of subjects and presumably some of them didn't get beat up.

Dr. DEARMAN. How do you know this word does not have meaning to this particular individual?

Dr. ORNE. Scientifically, it would be more parsimonious to assume that this is not a universal characteristic of the Antioch student Dr. Lacey is using.

Dr. DEARMAN. You still don't know what this word meant to an individual.

Dr. LACEY. No, sir; I do not. The word "emotion" is a very difficult word for the scientist to define. As a matter of fact, most scientists have given up defining it. It is a commonsense word. It is a word which represents verbal labeling on our part and apparently there is enough consistency in the verbal labeling to enable communication between Dr. Dearman and his patient, for example. This does not make the word represent scientifically a valid concept. When we say this person is afraid, angry, fearful, sexy, depressed, sorrowful, excited, happy, all these words mean something, but they certainly do not mean the same thing to all people.

Dr. DEARMAN. Exactly.

Dr. LACEY. Exactly? OK. Fine. Then we are in complete agreement. This very fact has led to the disappearance, by and large, of the word "emotion" from that part of psychophysiology which studies emotion. Many of us are engaged in trying to find more scientific formulation of what an emotion is. What is a lie? A lie is a very complicated concept. The physiological recordings will register disturbances, physiological responses, which mean many things. When a person lies or when a person is emotional—a variety of states, attitudes, transactions of the organism with the environment are implied. Some aspects are more emphasized in one individual than in another. We have no tools whatsoever for identifying with any degree of accuracy what these are. One thing, we don't have a vocabulary for them. What are physiologic transducers measuring? Physiologic responses. Everything beyond that is an inference. Now, I prefer some inferences at the moment. Science changes daily; 10 years from now I might decide my current views are a bunch of nonsense, but at the moment I prefer those inferences which relate the

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magnitude of the response to the available response repertory of the individual.

If a great many responses are called for by a stimulus, at the moment I am prepared to defend the notion that the physiological responses will be greater than if only a few responses are called for.

In the lie detection situation, it is perfectly possible to envisage—and I do not say this is the fact, I don't know—it is perfectly possible to envision that a given stimulus, a given word, invokes large scale autonomic responses, if indeed it does under those circumstances, simply because the subject is required to select from among a variety of responses available to him some response that will suit his needs at the moment. Indeed, this may be the scientific basis, if you will, for what I understand is a favorite countersecurity measure, the cover story, which is rehearsed over and over and over and over again so that the responses are completely automatic.

I have not done this experiment. I don't know whether Dr. Kubis or Dr. Orne have themselves, but it strikes me as a very reasonable guess that a properly rehearsed cover story would not be revealed or would be revealed with far less accuracy on a lie detector simply because drilling on a cover story has reduced response uncertainty.

You ask what does this mean for a practical lie detector situation? What I say it means is this. You get a response. All you know is that a response has occurred. You may now search with all the clinical acumen at your command for the reasons for this response. I am not sure it can be done. Again, this is not off the top of my hat. I might as well admit this is controversial as some people disagree with my interpretation of my experiment, but what I have done experimentally is what is known as unconscious conditioning in which, by associating a word with a rather fearsome electric shock, I have conditioned the subjects to show tremendous autonomic responses to, say, the word "paper." This is the analog to Dr. Dearman's mother beating this poor child because it desires to engage in—arithmetic.

The conditions of the experiment were such that, in my hands at least—there are some arguments about that—there was no way I could get the subject to verbalize why the word "paper," for example, or the word "cow" should evoke such a very, very strong physiologic response.

There was no way in the world I could get them on the basis of an interview, to verbalize the source of the physiological response, and I am fairly skilled at interviewing.

Now, it may be possible, there is no evidence for this, it may be possible on the analytical couch, after months and months and months of investigation, that one could elicit the reasons for this. But the point is, given an autonomic response, one only knows that an autonomic response has occurred. One then has to engage in a process of inference to find out what has happened.

Now, then, let us take Dr. Kubis' delightful experiment. Note that the scene is rigidly restricted, that by a very careful scientific design critical and noncritical stimuli are juxtaposed in time, which incidentally eliminates a lot of problems; the suspicious stimuli are repeated over and over. Because of the design of the experiment, because of what the experimenter knows about the differential significance of the word "button," to the simulating thief, and the simulat-

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ing lookout—because of these facts in the background, the basis for the inference is quite strong. In the hurly-burly of the true crime detection situation or security investigation, I don't know. I wonder about the bases of inference. Dr. Kubis would certainly know an awful lot more than I about when the realities are in a true crime-detection situation. The few contacts I have had with them suggest to me that there is not, by and large, this background knowledge to form a pretty firm support for the inferences made.

The fact that we are even willing to talk about lie detection as though a lie is some specific thing that can be detected simply is a reflection of the fact that in the laboratory, at least, the background data is such that we say this physiologic disturbance when compared with the physiologic disturbance which is engendered by the surrounding stimuli means that the subject knows something or has done something. But the strength of the inference only comes from the background knowledge that you have within the experimental situation.

Mr. REUSS. Mr. Chairman, could I ask a question?

Mr. MOSS. Certainly.

Mr. REUSS. I would like to ask this of each member of the panel. In the light of your observation of the art of lie detection as it is currently practiced in the United States and, having regard for the educational requirements of present lie detection operators, and having regard for the current use of the lie detection device both in Government and private business and both for investigation of wrongdoing and for preemployment screening, in your opinion is lie detection today a valid procedure?

I will ask each member of the panel.

Dr. DEARMAN. In my opinion it is not.

Mr. REUSS. Dr. Orne?

Dr. ORNE. I don't think that I could answer the question as a scientist. If you were to ask the question in terms of validity, I would like to define what I mean.

Mr. REUSS. First, what is your answer, and then you may elaborate on it.

Dr. ORNE. I would rather not answer it before I define what I mean.

Mr. REUSS. Fine. Define it first, then answer.

Dr. ORNE. If you mean by validity what is the accuracy of the report, this becomes a question which can be answered scientifically.

Mr. REUSS. My question has to do with the actual practice today of the so-called art of lie detection as you have observed it. Is it valid? Does it do good or does it do more harm than good?

Dr. ORNE. This is a moral judgment which is outside of my competence. I think I would refuse to answer that. As a scientist I can't have an opinion on that.

Mr. REUSS. In other words, you are not able to tell this committee that it is a valid procedure?

Dr. ORNE. I think that there are things that can be answered scientifically. One of them is—is it accurate; this is an entirely different issue from what you seem to mean by valid; namely, you are asking is it morally proper.

Mr. REUSS. Let me ask the question to the other two panelists, then I will come back to you.

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Now, Dr. Kubis.

Dr. KUBIS. Well, I had written a letter on how I felt about lie detectors in civilian operations where it may have been used, for, say, employment purposes.

If you wish, I could read it. This is a statement that I had thought about and I would read it to you.

Mr. REUSS. Fine. Although, first, tell me whether you think it is a valid procedure as currently used.

Dr. KUBIS. It is like whether things in life are black or white. It is a hard decision. I hate not to answer it because there are qualifications. It is only a short letter. May I?

Mr. REUSS. Surely.

Dr. KUBIS (reading):

I do feel that the growing use of lie detectors in many vital aspects of our daily life is unwarranted, dangerous, and degrading.

The use of lie detectors is generally unwarranted. There are relatively few situations so critical that justify lie-detection procedures. A good examination is time consuming and the services of an expert are required. But there are very few experts around.

The rapid growth of lie-detection services is also dangerous because the attractive fee structure encourages the inexpert or the quack to enter the field. Becoming an expert is almost synonymous with buying an instrument. There are no certification standards; and the competency of the ordinary lie-detector operator leaves much to be desired. Further, the instrument itself has yet to prove its worth under rigidly controlled conditions. Lie detection is still an art. Too often the capable interrogator (unconsciously or consciously) uses the lie detector as an anxiety-inducing stimulus to elicit a confession from frightened "first offenders," without even having to look at the record charts. When the lie detector is used as a deterrent (and this is the rationalization behind the periodic lie-detection checkups), it parades under the guise of infallibility or near-infallibility. And yet in the hands of an ordinary operator, the lie detector is relatively unreliable. The added danger that the expanded use of this instrument will more and more encroach on fundamental liberties and the fundamental right to internal privacy cannot be overlooked.

The threat to use the lie detector on a continuous basis in industrial and business organizations is degrading. The fundamental dignity of man is the issue. The periodic use of this instrument implies that the majority of innocent, trustworthy employees must submit to the test. And yet the lie detector is basically an instrument of distrust, to be used where there is a strong suspicion that one or more individuals are not telling the truth. In the "storewise" checkup the innocent are placed in an embarrassing role—that of being considered a suspect whose word and intentions are fundamentally distrusted. It is no argument to say that the test is used to prove the innocence of the innocent, or to "protect" the reliable employee. Since the instrumental test is far from perfect, there is a strong possibility that the innocent will be judged as culprits.

This is not to deny that the use of lie detectors on a continuous basis in business and industrial concerns does reduce petty thievery. Whether this is the only appropriate procedure to use with responsible human individuals in these relatively trivial circumstances is the point at issue. Further, the use of the lie detector merely as a threatening deterrent violates scientific integrity, since the advertised use implies a scientific accuracy that has yet to be proved.

Finally, in the hands of inexperienced and unscrupulous men, the instrument assumes the character of a blindly probing instrument than can severely damage the inner life or reputation of the person tested. Reference is here made to the "fishing" expeditions that deeply embarrass the worker and yield no useful information to the operator. The responses to personal and sensitive questions, because they are highly emotionally charged, may be misinterpreted by the operator. Who knows what use such misguided interpretations are put to, how long they remain in the personnel file of the company, and how often they are transmitted as "reference material" when the worker leaves the employ of the company?

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I hope some of these ideas may prove informative. They are mainly directed at incompetency and at a not-too-well-established case for the validity of the lie detector in the hands of the ordinary run-of-the-mill operator.

Mr. REUSS. So that your somewhat extended answer boils down to your opinion that lie detection as currently practiced in the United States is not, by and large, a valid procedure?

Dr. KUBIS. Is not, by and large, a procedure that should be used.

Mr. REUSS. Yes. That is your testimony, is it not?

Dr. KUBIS. That is right. I don't see the use of a lie detector in trivial situations. I cannot see the use of such instruments for hiring purposes, so as to predict whether the individual will be a good worker. We have no way of determining whether an individual will be or will not be a good worker, or will be reliable or will not be reliable, or will steal or will not steal. We have no way of determining such things through the pens of a lie detector.

Mr. Moss. I wonder if we could ask, on the statement just made by Dr. Kubis, if there is any disagreement among the panel members?

Dr. DEARMAN. I do not disagree with his statement myself. I think it true.

Mr. REUSS. Dr. Orne?

Dr. ORNE. As a private individual, I would agree completely.

Mr. REUSS. Dr. Lacey?

Dr. LACEY. Wholeheartedly.

Mr. REUSS. Would you care to add anything on this general evaluation of the current practice of lie detection?

Dr. LACEY. I would, Mr. Reuss, except that may I say, like Dr. Orne, I cannot answer that in one sentence. Just as you have qualified "by and large," I would have to qualify. If I may have a moment, let me say that one of the feelings I hope to leave with the committee is that the questions as given are unscientific. I would also like to leave the notion that there are critical areas in our Nation's life where I can conceive—I am not prepared at this moment to state that I really support it—of polygraphs being utilized—with all sorts of precautions to protect the individual under interrogation. I can conceive where they can be used with a frank acknowledgement that we have an imperfect instrument but we cannot tolerate a false negative. In others words, sir, when you ask is this valid or not, no scientist can give an answer because validity is a matter of degree. As a matter of fact, we have a mathematical device for expressing validity. We say the validity coefficient is, for example, .75. This communicates from one scientist to another. I now know that 49 percent approximately of the variance of one variable is accounted for by another.

This is scientific jargon, but the serious point is that validity is a matter of degree for any test being used in clinical medicine, in psychology or in physiology. So it is very difficult to answer your question.

I can answer a question I will pose myself. Do I feel that the figures published convince me that it is of high enough validity to be used as it is being used? My answer here I am afraid is an unqualified "No."

Mr. REUSS. If I may say so, that is a responsive answer to the question I was asking: Using your best knowledge of the art of lie detection as practiced in the United States today, is this, in your opinion, a currently valid procedure in terms of crime detection, in

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terms of employees screening, and in terms of individual rights, taking all those together?

Dr. Orne, I guess I should return to you.

Dr. ORNE. I think many of the points which Dr. Lacey made quite earlier are the reasons for my difficulty. Unfortunately, the question of validity implies does it work. Now, if you were to ask is it valid to tap wires, I would have to say, well, it gives you the information; there is no doubt about that. If you were to say do I agree that it should be done, I would say no. I would not say it is invalid. I would say it is not right, it is improper, I don't like it.

Mr. REUSS. Let us take your example. I, too, have a view on wiretapping which is irrelevant here. But, as you say, if you tap a wire and make a recording of what the suspect says, this is most helpful. This accurately records what he said and particularly if, in the course of it, he is plotting a crime or confesses a crime, this is—moral considerations aside—handy to have. However, what is your view, moral considerations aside, of the efficacy of the so-called lie detector as practiced in the United States today for the purpose for which it is practiced: employee screening and detection of wrongdoing? Does it do a good job or poor job?

Dr. ORNE. This is what I want to separate. I would say we have relatively little data on the practice of lie detection in the United States today. We have data that indicates under proper circumstances in the laboratory you can assign reliable probabilities to, whether you can categorize people. There is no doubt about this. I think all of us would agree on that.

Mr. REUSS. However, my question was not concerning laboratory tests which admittedly show a considerable degree of success by the so-called lie detector indicating whether somebody has turned over a red card or a black card, and so on. I am concerned with how it is actually practiced today. You have been studying this, as have your colleagues, for years and have, if I may say so, a unique knowledge of it. That is why you are here today. This brings me to my question.

As practiced today, having regard for the training or lack of it, of the operators, having regard for the claims of success of its proponents, having regard for the uses for which the tests are conducted, is it a valid procedure?

Dr. ORNE. Allow me to give you the data and the reasons for it. In the laboratory, we know that the more motivated the subject is the easier he is to pick up. In other words, if you do not care about being picked up in the laboratory situation, you are very difficult to detect. If I give you $10—if you fool me—you become very easy to detect. It is an interesting paradox; that what makes the detection of deception possible is the attempt to deceive. Since this is the case, one would expect, because we have no data from the field really, the statistics are just not useful, therefore we have to extrapolate. One would say on the one hand, well, because in the real life situation the suspect is much more motivated, the detection of deception should be easier. On the other hand, the conditions in real life are imperfect, the data may be contaminated. It is easily possible to bias this kind of data.

If I ask you, let us say, is it No. 1? is it No. 2? is it No. 3? is it No. 4?—in a loud voice—I am going to get a response regardless

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of anything else. Just by changing the tone, by changing emphasis, and so on. This is on the negative side of the ledger.

How these two variables in fact work out—I mean there are reasons to believe it should work better in real life if conditions are not well controlled. However, we know that this is not always the case and, therefore, it is difficult to weigh these factors. No one has yet taken the data of real life and analyzed it properly.

On the one hand, the lie detection people would like to say: Every time we make a decision, this is right. So they arrive at, you know, 99 percent accuracies which, in our view, are not correct.

At the same time—if you take, as was done, where decisions have been verified and compare this to the total sample, analyzed—it does not tell you anything, either.

No one has really bothered to take all the verified decisions and studied what the probability of being right and wrong are of only those where we in fact know what happened, subsequently. There is no data available.

Dr. LACEY. Indeed, the problem of verification is a very difficult one. Dr. Dearman's case is an instance of a false confession, confession is a common criterion. The case shows that we have to know the reliability of our criteria.

Dr. KUBIS. I think, as you phrased the question, it was in terms of a dichotomy; where wrongdoing has happened and where personnel screening is to be done. These are two very different issues.

My main objection is to personnel screening that gives a pseudo-guarantee that the individual will act so-and-so in the future on the basis of these results. This is sometimes done on the basis of what he has done in the past.

Although in some instances the past may indicate that he may be do the same thing in the future, this is not inevitable. Once a person has stolen some pencils 5 years ago, this may or may not be a good indicator whether he will steal in industry or in business. There is a different viewpoint in personnel selection from that in police work. In personnel work there is a regard toward the future. In terms of the criminal situation, there is a strong regard and emotion toward the past. The objective is to see whether he actually had done something in the past and to determine whether this is an objective incident.

These two issues, I think, cannot be lumped together. I know there are quite a number of good individuals who obtain results that are greater than chance. Furthermore, if there is no other information obtainable in a criminal case, and it is only in such cases that I believe the lie detector should be used, and if a lie detector in the hands of this individual can add some information; say, can change the balance from 50–50 to maybe 60–40, this is at least added information. Not that it should be accepted legally but this should be used to obtain further information. The information you gain in that interrogation may lead you into new alleys where you, by investigative work rather than by lie detection work, can get added evidence.

Mr. REUSS. Thank you.

Mr. MONAGAN. Mr. Chairman.

Mr. MOSS. Mr. Monagan.

Mr. MONAGAN. I think Dr. Kubis partly answered the question I was going to ask. In responding to Mr. Reuss, when he asked about

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the validity of the use of this procedure, you stated you would not use it—and you used the term in "trivial situations."

Dr. Lacey said something about the determination of the use being a matter of degree.

You have since differentiated between preemployment use and criminal use. Is that the sort of thing you had in mind when you used the term "trivial situations"?

Dr. KUBIS. Yes.

Mr. MONAGAN. In other words, the social considerations and criminal investigations might be more important and might sanction the use where you would not use it either in private industry or in Government in preemployment cases?

Dr. KUBIS. And I think preemployment, too, again can be divided into two parts. There may be certain types of positions where you may have to know the background of the individual, involving very important security considerations, where that type of background may be used by somebody else to the detriment of the organization. Such information may concern the vital security of the Nation, and it could be detrimental to that organization or to the country, if others may make use of that individual. I am considering as trivial, nonsensitive jobs; say, clerical jobs.

Mr. MONAGAN. The importance of the interest to be protected might justify the use to a greater degree?

Dr. KUBIS. That is right.

Mr. Moss. Any further questions?

Mr. REID. Mr. Chairman.

Mr. Moss. Mr. Reid.

Mr. REID. Dr. Orne, I gathered, while I was out of the room briefly for a phone call, you questioned the validity of the use of the polygraph. Did you touch on the question of training and standardization for polygraph operators?

Dr. ORNE. No; I did not.

Mr. REID. Will you comment on that?

Dr. ORNE. It would be a very difficult decision to decide what is proper training. I do not know who should set up the ground rules for it. I am sure we all agree that we should have a trained person. What is proper training, however, is difficult to determine. Should you require him to have a Ph. D. in psychology? If you do, you will have very few polygraphs in use because there are not enough psychologists and of those I can't think of any who would do it.

Mr. REID. Might I ask a specific question to pinpoint it a little more precisely? I think the testimony we have heard from several Government departments indicates that the training standards are minimal. Indeed, one department trained operators for a period of only 6 days. Would it be fair to say, in your judgment, that is totally inadequate?

Dr. ORNE. May I answer the question in this way: I would say that what is the proper training for an interrogator—if you ask me that question, I would have a very hard time answering it also. I don't know what proper training is for an interrogator. I have been very impressed with a couple of people who were police interrogators who seemed to be very good at it. How they became good at it, I don't know. Whether they came that way or whether they learned it, I

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don't know. I know it is this kind of person who is really good and I think Dr. Kubis' work shows that there are people who are good at it, and there are people who aren't good at it—if you could pick the good ones, you would be in fine shape.

Mr. REID. To put the question in another way, if I may interject here and separate the trained interrogator out from the individual who is professionally qualified to interpret the tracings. As I understand it, we are dealing with a number of variables: the question, the possible response to a given question as well as a number of physiological reactions both autonomic and otherwise, including the specific reactions of up to 19 different tracings. It would be my impression from what I have heard that this would require someone with a rather comprehensive background and maturity of judgment.

Dr. LACEY. And a computer.

Mr. REID. Some have even said that you should have a doctor and a psychiatrist and a few other things combined in one. But a high school or college graduate who has had no really professional training in some of the disciplines, whatever you may define as qualified, seems increasingly to me to be very questionable.

Dr. ORNE. I would very much agree with this. I would add one more point, however. As we get to know more about the technique, the more you know about a method the less training you need to have. For example, thanks to penicillin, during the war technicians in a submarine could save lives, they could give a shot of penicillin. You would not do this now. You prefer having a medical man. But it is potentially possible.

If we knew really enough, if enough adequate data were available, you would, and I think it is ultimately possible to have this be a fairly mechanical, a fairly objective decision. The more objective you can make the decision, the less judgment is involved, the less training is needed. Ultimately, it may be possible for statements to be made in terms of probability of guilt or innocence based on objective procedures. If we had enough knowledge, I would not worry about a high school student, a high school graduate being trained if he were taught how to make the right measurement of the right wiggles in the right place, and plug in with the right formula he could come out with an answer.

I would be much more worried about the fellow who is going to use the data because then it will be objective data stated in objective scientific terms; namely, a probability which you can verify.

Mr. REID. To deal with the specific problem which I think is facing this committee, and in a sense the Government as a whole, it is that there are over a thousand of these polygraphs in use, if we include CIA and NSA. The training standards appear to be relatively minimal. At this juncture would it not be well, in effect, to call a halt to the use of a lie detector until such time as some adequate procedures and standards and training are worked out both from the technical standpoint and from the implication of the individual, because the Government is using them and apparently the reports of the technicians reading these tracings have some relevance to the particular investigation.

The review procedures seem to be somewhat questionable, and the protection of the rights of the individual is not very clearly guaranteed. Even if the examiner was well trained, I am not clear that

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the administrative decisions which you allude to are being carefully reviewed or that the rights of the individual are protected. Therefore, my question, after a rather wordy preamble, is: What do you think the Federal Government would be well advised to consider doing in terms of procedures, methodology, and protection and review procedures in terms of the rights of the individual?

Dr. ORNE. The more training the better, obviously. I think this is a pragmatic question which is really administratively determined, depending on the need, depending on the availability of personnel. There is no point, for example, in my saying you should have only people who are psychiatrists with proper training in psychophysiology doing it because this would be totally unrealistic. They are not available.

There should be no point in saying you should have only Ph. D. psychologists doing it. They are not available.

The question is the cutoff point which is a commonsense decision and not really a scientific one in terms of what the needs are and what is the best kind of available personnel you can get. I certainly think it should be a college graduate, but this is no guarantee of anything.

We certainly know that there are psychopaths who get through college, too. Some of them, unfortunately, even finish professional school.

There is no absolute guarantee you can have, including giving those people polygraph tests. I think we all agree that would not work, either.

Mr. REID. Would you continue relatively unrestricted use of the polygraphs in certain areas or would you, in effect, call a halt until an interdepartmental committee can check the validity of the procedure?

Dr. ORNE. I think I would want to know what the consequences of calling a halt are. As Dr. Kubis, for example, points out, for very sensitive security purposes, a polygraph gives some information. I would not want to be responsible for depriving us of necessary information. However, at the same time, I would like to see some body get together and find out what is available, what the needs are, and to set up some decent standards after these facts are known.

I don't think I have any information to base any judgment on. Maybe Dr. Kubis has had more acquaintance with people who do this kind of work.

Dr. KUBIS. There are two questions there, Mr. Reid, as you have mentioned, the training of the person and a violation of the rights of the man being examined. If there are violations of the rights of the person being examined that procedure should be halted immediately. If this has any relationship to his training, then that sort of training, that negative aspect of the training should be eliminated.

As for the individuals that I have seen working in the field in responsible positions, I have a lot of admiration and respect for them and for their acumen in being able to get many answers which I would have to go through in a plodding way. I don't know how many are ill trained. If there are people who are not well trained, perhaps these facts can be obtained from a study of the accuracy with which they have been able to determine what they were after. There is always some feedback later on as to whether the man actually did or

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did not commit the "crime" and maybe we could examine such records before any blanket rule is promulgated to eliminate all interrogation.

Mr. REID. But you would favor the prompt estabishment of a committee to deal with the two points that you mentioned?

Dr. KUBIS. Yes, I certainly would.

One is a legal question, the rights of an individual; the other is a training and educational problem. The lawyers obviously have their job in the rights section; the other is in the training area.

Now, I don't know too much about the training procedures that have been in existence.

Mr. REID. On the first point we have had a witness who has indicated perhaps 80 percent, and I underscore perhaps 80 percent, do not measure up to what he considered professional standards.

On the second point, the rights of the witness being examined, we have had one piece of testimony that indicated that confession was secured on the basis of a polygraph examination, solely on the basis of that, and with no other supporting evidence.

The question that immediately arises—was the confession induced by the polygraph and were the rights of the individual infringed in that regard?

From what I heard, I was not wholly reassured that they were not.

Thank you, Mr. Chairman.

Mr. HARDY. Mr. Chairman.

Mr. Moss. Mr. Hardy.

Mr. HARDY. You have lost me completely now. I was pretty well lost in the beginning.

A while ago, in the discussion with Mr. Reuss on the question of the validity of the polygraph tests and the results which were achieved I thought I understood you gentlemen to be in pretty good agreement. I know Dr. Lacey came in with his own question, which he answered—but I was left with the feeling that there was pretty good agreement that validity was such that it ought not ever to be used in trivial cases, and I believe Dr. Orne so stated it in expressly those words.

Then we got into another area of security cases that purely for possible past suspicions which might provide an avenue for additional investigation—at least that is the way I interpreted it—if I am wrong, clear me up—but the answer you gave Mr. Reid sounds to me like you are all endorsing the thing.

Dr. DEARMAN. I am not.

Mr. HARDY. Fine. I am glad to get that one. If I misinterpreted the rest of you, I would like to get it clear, because I think we have a direct conflict.

Dr. ORNE. I think the question of validity——

Mr. HARDY. If the thing is not valid, then it ought not to be used, if we can't rely on it.

Dr. ORNE. That is exactly it.

Mr. HARDY. Then you distinguish between validity and reliability. You were talking about probability. Probability relates to reliability and validity.

Dr. ORNE. Right.

Mr. HARDY. So you have to have a mathematician to go along with your psycho—whoever he is.

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Dr. ORNE. That is part of the training. Let us put it this way. I think that probably, judging from laboratory studies, there is no question that the detection of deception works better than chance. I don't think you will get any disagreement on that.

There is a question, depending on the conditions, how accurate it is and this is why I wanted to use the term "accuracy." Probably a guess which would be meaningful would be somewhere between 75 and 80 percent. Now, if this is the case, then this is all you are going to get from it with present day available techniques and it becomes an ethical, moral, administrative decision when you will take advantage of this 80 percent or so which the gadget gives you.

Mr. HARDY. Could I assume, then, Doctor—I don't want to interrupt your train of thought—but could I assume that if you got an 80 percent probability of its reliability, given an operator who is not too bright, who might have an 80-percent factor for fallibility——

Dr. ORNE. I don't think it should go the other way assuming—I don't know. I have no way of judging what would happen with somebody incompetent. However, I would say that the analysis of the data is not complicated. I mean the objective of measuring of the wiggles of a line is something which anyone can do.

Mr. HARDY. What is your basis for the 80 percent figure that you used of reliability? Is that an assumption or is that an experimentally determined figure?

Dr. ORNE. No; this figure is based on laboratory studies.

Mr. HARDY. Laboratory studies by a psychologist?

Dr. ORNE. You can have them from a psychologist, from a psychophysiologist, you can have them from psychiatrists.

Mr. HARDY. How about the ordinary policeman?

Dr. ORNE. I have no data.

Mr. HARDY. That is what we are having to use. We are using all sorts of people in this thing. A private in the Army. A sergeant.

Dr. ORNE. There is no data available.

Mr. HARDY. So then we are monkeying around with something we don't have any data on and the degree of reliability is such that, according to the unanimous testimony of the group, as I understood it, it ought not to be used in trivial cases and now you are only going to use it as a guide to determine what has happened in the past, you can't use it as a guide for the future. At least, I understood Dr. Kubis to emphasize that. So you can only use it as an indicator of what has happened in the past and then, after you get that, you don't know whether you are right or wrong or whether you are 80 percent right or 90 percent wrong.

Dr. KUBIS. May I state that the people who have been working in the field, the Chicago group and other groups, do publish numbers.

Mr. HARDY. I know, I have seen some of them. We had some testimony about them.

Dr. KUBIS. There are such numbers in existence. I think some of the police laboratories also publish numbers. These are of the order, as Dr. Orne said, from 75 up.

Mr. HARDY. You do not know how factual they are.

Dr. KUBIS. That is another matter.

Mr. HARDY. If they are not factual, what good are they to us?

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Dr. KUBIS. I think you have just raised a question that you don't know.

Mr. HARDY. That is right. I am just as ignorant as I can be. You all are not helping me very much, either.

Dr. KUBIS. I may say that I don't know whether there is life on the moon or not. I don't know because I haven't investigated and I haven't checked on the data. Until we check on that data, we cannot be sure, but all indications seem to show that they are about 80 percent, 75 to 80 percent accurate.

Mr. HARDY. But you could use a computer to arrive at some conclusions with regard to that on the basis of the information that has thus far been gathered. By your own testimony, you can't take a computer and evaluate the information which a polygraph gives you? Did I not understand you to say that earlier?

Dr. KUBIS. That was the basic conclusion because each individual is different from every other and I need a single criterion for all individuals.

Mr. HARDY. But you can do a better job in evaluating the data you have about the probability of life on the moon than you can evaluate what is in the individual's reaction which may not conform to the general pattern of humanity. The norm of the individual was discussed by Dr. Orne a while back.

Dr. ORNE. Could I try to answer that one this way: If I give you a record—now, you have no training at all—

Mr. HARDY. That is right.

Dr. ORNE. In polygraphy. You obviously have had a lot of training in asking questions.

Dr. LACEY. We don't know how valid they are.

Mr. MEADER. Is this training or did he just come naturally by it?

Dr. ORNE. I don't know. But it is effective. If I give you a record and I say, "Now, here are 5 points, you tell me which one of these is the biggest wiggle, that is all you have to do, and I ask you to make this judgment 20 times and we can take somebody totally untrained to make these judgments. Out of these sets of judgments by untrained people, on wiggles of a pen, you can end up in a laboratory study with an accuracy rate depending on the condition on which you are using it, somewhere between 75 and 80 percent, depending on the study. This is untrained people in the sense that all you are making is a judgment, which one of these five wiggles is bigger than the other wiggles.

So I would say there is a basis, a scientific basis, on which you can say there is phenomenon that works.

Dr. LACEY. It is not judgment; it is a matter of measurement.

Mr. HARDY. But do you know what it means?

Dr. LACEY. I said before, sir, everything from that point on is an inference.

Mr. HARDY. That being the case, if it is an inference, who are we or who are you to pass judgment on what the thing really infers?

Mr. REID. If the gentleman will yield?

Mr. HARDY. I am through. I am just as lost as I was when I came in.

Mr. REID. In pursuance of your erudite and your most expert questioning, could I ask just one other?

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We have had information before the subcommittee that indicated that only about 30 percent of certain polygraph tests have been ever verified. I believe, Dr. Orne, you said there has been no real study of verified cases. You have also said that there is some probability of false innocence and false guilt. Therefore, we do not have any verifiable data, do we, that actually proved out, that the cases in the polygraph and the tracings all checked out. Therefore, are we not trying to use a procedure that has no real backup statistically through verified cases?

Dr. ORNE. I think this is the problem of the base you use. I would be personally interested. I don't happen to know the data but it would seem to make sense to me to look at the cases which have been subsequently verified, because there is no reason that these cases are particularly different from the other ones and judge from these cases what the total accuracy rate ought to be. That would be the best approximation we could get at the moment. There is no question that this is a feasible procedure.

When we talk about 80-percent accuracy rate, and I would like to go back to this point for a moment, if I may, we can set it up so that we can maximize the probability of accurate determination of innocence and accurate determination of guilt. If you do that, you use the best cutoff point, you end up with roughly 80-percent accuracy. You can also set it up so that you get essentially 100-percent accuracy in terms of innocence, but that means you are going to drop your accuracy of picking up guilt to maybe 50 or 40 percent. You can also for another purpose decide you are going to get 100-percent accuracy of picking up guilt but then you inevitably pick up a lot of false innocents.

Mr. REID. Does that not really say this: that there must be very substantial thought given to the administrative decision which is what you are talking about, as to precisely what you are doing, what relevance the results might have and whether, in fact, they lend themselves to verification or not.

Dr. ORNE. If I may just carry out this example for a minute. If this were, let us say, used for fairly trivial purposes, then I would for one want to be certain that there is just about as close to zero probability of picking up somebody innocent and calling him guilty. If we lose a lot of guilty people, that is just too bad.

If, on the other hand, this were, let us say, a very vital security issue, I think it would perhaps be legitimate to say we just can't afford to have the wrong fellow here and we will have to exclude people who would be perfectly fine but we just can't take a chance. It is then an entirely different issue.

Now, this is more of an administrative decision. All the scientist can tell you is how good your data is. Then somebody else has to make the decision what he should do with it. This business of 80 percent accuracy really is not meaningful unless you begin to ask at what point are you accurate and you can't have it both ways. If you want to eliminate all people who could conceivably be guilty, you are going to be including people who are innocent. If you want to get all people who are innocent to be sure they are innocent, you are going to be missing some people who are guilty.

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Mr. REID. Are you aware of anything in the Federal Government where this kind of administrative decision is made where there is a standardization as to professional standards and some understanding of what we are really doing? Are you aware of anything in the Federal Government which attempts to do what you are talking about?

Dr. LACEY. In lie detection or in other areas?

Mr. REID. In lie detection.

Dr. ORNE. No. I would say this kind of observation has never been made in the literature. This is why I am trying to make this point. It is because people have kept trying to talk about accuracy rate without recognizing that you can shift these by an administrative decision which leads you to very different conclusions, given the same data.

Mr. REID. And perhaps very erroneous conclusions.

Dr. ORNE. Yes.

Mr. MOSS. Mr. Reid, it might interest you to know that on April 27, the Department of Defense acted by memorandum directed to each of the service secretaries, to the Chairman of the Joint Chiefs of Staff, and to the Director of the National Security Agency to at least clarify some of the policies governing the use of polygraphs. The instruction is as follows:

> No examination with the aid of a polygraph shall be conducted without advising the subject to be interviewed (1) that he has a right under the fifth amendment to the Constitution or, as appropriate, article 31 of the Uniform Code of Military Justice to refrain from doing anything that may tend to incriminate him; (2) that the polygraph examination will be conducted only with his prior, written consent; (3) whether the area in which the polygraph examination is to be conducted contains a two-way mirror or comparable device, and (4) whether the examinations will be monitored or recorded in whole or in part by any means.

It is signed by the Deputy Secretary of Defense, Cyrus Vance.

Mr. REUSS. What is the date of that?

Mr. MOSS. April 27.

Mr. REUSS. This is news to me and most welcome news. I certainly want to commend the Defense Department for that directive.

Mr. MOSS. Mr. Meader.

Mr. MEADER. Dr. Dearman, you may be aware that a letter that you sent to the chairman under date of April 5, 1964, was inserted in our record. It appears on pages 44 and 45 of the hearings. (See pt. I, hearings.) I interrogated the witnesses, one of whom was a Mr. Inbau, I believe he was a professor of law at Northwestern University, and I wanted to read a paragraph from your letter. It bears on the directive that the chairman has just read. You said, and I quote:

> In my opinion, the use of the polygraph violates the fourth amendment as regards search and seizure. I am also of the opinion that its use violates the fifth amendment. I am aware that proponents of the use of the polygraph fall back on the statement that no one is forced to take a polygraph test and use this as a means of satisfying the constitutional requirements. However, this is of little or no avail because the examinee does not realize that not only will his conscious thoughts and his autonomic responses to them be recorded but his unconscious thoughts will also be delved into and consequently he will give autonomic responses to unconscious thoughts or, to put it another may, he will be giving autonomic responses to thoughts of which he is totally unaware. This is never explained to the examinee and I doubt if the examiner himself is aware that this is taking place.

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Dr. DEARMAN. Yes, sir.

Mr. MEADER. I don't know if you have read our record but the law professor thought you ought to stick to psychiatry and not pronounce constitutional interpretations.

Dr. DEARMAN. Yes, sir.

May I say something here, sir?

Mr. MEADER. Yes. I want you to develop this because the question of the invasion of an individual's rights is one that is very important to me. You make the point of the unconscious thoughts.

Dr. DEARMAN. Yes.

Mr. MEADER. Now, if the examiner advised the examinee that not only were his conscious thoughts but his unconscious thoughts to be recorded and he still consented, would you think that was a violation of the fifth amendment or the fourth amendment?

Dr. DEARMAN. It is according to how much explaining you went into with him. In other words, if you could explain to him that you were going to find out things about himself that he was not aware, and after this if he wanted to take it, then I would not think that was a violation. But you would have to go into great detail to do this.

May I say here that Professor Inbau also said that the use of the lie detector was no more an intrusion into the mind than that of the psychiatrist.

So I would just like to read you something here. When the polygraph examiner comes in he tells him he can take the test or not take the test. When I see a patient who is involved with the law or that I think will become involved with the law, I read him these seven statements: (1) That I am a doctor who is specialized in psychiatry; (2) that I am interested in understanding how he happens to be sent to me; (3) that I will take notes or make a tape recording of what you tell me; (4) that I will send a letter stating my opinion to your attorney or representative; and if the attorney or representative requests it, I will send a copy of the complete psychiatric workup; in case of court action, the judge or anyone he designates in the court, may also get a copy of the letter or complete record if they so desire; (5) that I may have to testify in court; (6) that you do not have to answer questions; that if you would rather not have a certain answer written down or recorded you should explain that you would prefer not to answer that particular question, and that it is all right for you to do so; and (7) that I will give my opinion, based on my examination of you, and that it may or may not be to your liking; that even though you may be paying my fee I will give as objective an opinion as is humanly possible for me to do, and in cases in which I appear in any court I consider myself an expert for the court and not for any individual.

After I have read him the statements, then, of course, the questions come. I explain to him my reasons for doing so.

I explain to a patient he, in effect, is putting himself in the position of testifying against himself.

At this point he usually tells me that he has nothing to hide and he will tell the truth.

I then further explain that in talking to me he is going to reveal to me things about himself of which he is unaware, that in effect he is going to tell more of the truth than he himself realizes.

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The polygraph examiners do not do this.

Mr. MEADER. You, in effect, say that if a polygraph examiner did instruct the examinee in accordance with the instructions that you give to your patients, and the examinee thereafter consented to the examination, there would be no violation of the fourth amendment or the fifth amendment?

Dr. DEARMAN. Correct, sir, but the examiner has to know enough about human personality to explain what might happen. He has to give an example. Let us take a person who is involved in some psychopathic act. This is the first time it has ever happened. He comes in to see me. In talking to me, he might tell me when he was a small child he used to pull the heads off cats or rats and what great delight he took in doing this. He would think this has nothing at all to do with what I was seeing him for, when in effect, it has a lot to do with it.

Mr. MEADER. In other words, you are saying, aren't you, that unless a psychiatrist gives the polygraph examination, it would be unconstitutional because no one but a psychiatrist has the capacity to explain to an examinee that his unconscious thoughts may be recorded?

Dr. DEARMAN. I agree with you, sir.

Mr. MEADER. I see a little disagreement here.

Dr. Orne?

Dr. ORNE. Speaking as a psychiatrist, also, I would think this is a very interesting statement to read to a prospective patient whom you are evaluating for the court.

I think as far as current psychiatric practice in the United States, it should be clear for the record that I would venture there are only a very few or a small group of psychiatrists who would be explicit in this form. I think all psychiatrists who have done any evaluation of patients somehow communicate this, and this is certainly within the ethics of the profession. Nobody disagrees with it. But, and I think this should be made explicit, if one is following this logic one gets to a very difficult position because, as a psychiatrist, it should be clear that the fact that you read this kind of statement to a prospective patient and the fact that you in good faith try to explain, we know enough about selective perception, about people hearing what they choose to hear; that one can argue that there is no way you can communicate it to him following the same path of logic, and that the fact that you go through the motions of reading this kind of document is not really the crucial thing at all. I could read somebody this and then proceed to violate his rights by using information against him maliciously, a whole bunch of things, from which he would be in no way protected by this. He is protected by my own ethics, if you will, and he is protected by these whether or not I read the statement, because this, for the most part, has been explained to him before he even gets to see me if he has an attorney. The attorney certainly has explained this to him because this is the standard position.

I think that we may be kidding ourselves and I would like to make this explicit. I, personally, do not think that it would really protect the individual any more to tell him this. Fine. By all means let us tell him this, but it would not protect him from subtle pressure to take the examination, it would not protect him from the way he is asked, and the perfunctory reading certainly would not do it. Even if

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the individual were equipped to explain, and I would object to the fact that this would have to be a psychiatrist to explain it, I think other people are competent to explain this kind of statement, but even if it were explained to him, the only protection would be in the ethics of the individual explainer.

Mr. MEADER. Let me ask, Dr. Orne, you listened to my reading of the paragraph from Dr. Dearman's letter, do you agree with that?

Dr. ORNE. I am not competent to make moral judgments. I do not choose to make them as a scientist. I am merely trying to testify on points of fact, what I view to be observations of the present practice.

Mr. MEADER. Do you agree with this statement, then, as a scientist:

> The examinee does not realize that not only will his conscious thoughts and his autonomic responses to them be recorded but his unconscious thoughts will also be delved into and, consequently, he will give autonomic responses to unconscious thoughts.

Dr. ORNE. I would say that this is a possibility which occasionally occurs. I think that Dr. Dearman has written up a very interesting example where this occurred. I do not think this is the usual thing that occurs.

There is one problem I would like to ask rather than answer and I wish Dr. Dearman would explain it—what we do when we examine somebody with an IQ of 90 who just does not understand this. Do we then have no right to examine him?

Dr. DEARMAN. Obviously, you have the right to examine him. How can you say a man with an IQ of 90 could not understand this?

Dr. ORNE. Let us say you have run into a patient who does not understand it and you know he does not understand it, but he agrees.

Dr. DEARMAN. Then I would talk to his lawyer.

Dr. ORNE. Let us say the lawyer agrees but he does not have the ability to judge that he gives consent to his lawyer to agree. You get into a thorny question which is an impasse. I do not know the way out of it.

I just would like to raise the point I do not know the way out of it and we should be aware of the questions we are raising.

Do you see the essential problem?

Dr. DEARMAN. Yes; but, you see, if he does not have consent enough to give me this or his lawyer this, he does not have consent enough to go to court and know why he is there.

Dr. ORNE. Right. You have to testify to that and he has not given you consent for that and you do testify to that in that case.

Dr. DEARMAN. Right, but I say in my opinion this man does not have the ability to recognize what is going on but I don't write up the report and tell all the things he has told me. I do not violate his confidence. I say this man is a sick man. That does not violate his confidence.

Dr. ORNE. I think you can see the ethical problem I am pointing to which I don't know the way out of.

Mr. MEADER. I would like to have the other two witnesses comment on that paragraph from Dr. Dearman's letter.

Dr. Moss. Dr. Lacey.

Dr. LACEY. Which aspect of the paragraph, sir, do you wish me to comment on?

Dr. DEARMAN. Shall I give him a copy of it?

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Mr. MEADER. Yes.

Dr. DEARMAN. The third paragraph.

Dr. LACEY. You mean does it violate the fourth amendment and the fifth amendment?

Mr. MEADER. Right.

Dr. LACEY. I am not equipped, sir—I am aware that to develop an appreciation of constitutional law one has to be familiar with a great many cases and a great many fine distinctions. I am not in the least bit familiar with them.

Mr. MEADER. Primarily, I was concerned with the matter of the unconscious thoughts and the recording of the response.

Dr. LACEY. The polygraph, Mr. Meader, in any of its forms records only physiological responses. From that point on, one engages in an inference. Where Dr. Dearman might see an unconscious thought, I might see something else. One will almost always detect physiological changes. It is hard to appreciate unless you have been in a laboratory, unless you have been doing it all the time—I have been doing it since 1942—it is hard to realize how ubiquitous physiologic responses are. It is difficult for me to conceive of any piece of behavior in which the organism will engage which will not be accompanied by a physiologic response.

There is a picturesque phrase used by the late Dr. Davis, which I think depicts this. He calls it the sea of response. If you have proper instrumentation this is what you see, a sea of response, a constantly restless moving pen, whether you are looking at blood pressure, heart rate, electrodermal activity, brain waves, pupillary dilation, blood flow—you name it. These things are always changing.

When we impose a stimulus on an individual and a response occurs we say the response occurred because of our stimulus. We cannot be sure that that is true because a piece of spontaneous activity, some shift in attention, some random thought could at the very moment of time produce that response.

We have then to insure by repetition—repetition itself brings along its own problems—but we have to assure by repetition that that response is indeed timelocked to our administration of the stimulus. A variety of things occur. I do not think—I will put it in another way—I will retire to my laboratory and generate a polygraph record. I will give it to Dr. Dearman, Dr. Orne, Dr. Kubis, and myself, and I will say, "What has happened?" They can only tell me, "Look at that interesting increase in blood pressure, look at that GSR, look at that vasoconstriction." All they can say is something has happened.

Then I will say, "Well, at this point in time, I was talking to the individual about his sex life."

"Oh," they will say, "yes, indeed, this is exactly what happened." I will say, "I was kidding you. What I really did was to ask the individual to multiply 7 by 11, and then add 54." The records are indistinguishable.

Dr. DEARMAN. Don't put words in my mouth. You don't know what I would have said.

Dr. LACEY. The point I am trying to make is that one cannot look at a polygraph and say what the circumstances were that produced this change. This is an inference. It is an inference drawn, as I pointed out before, from the background of the administration.

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I have done experiments on "unconscious thoughts" and you may remember I put those words in quotes before. I will still keep them in quotes, but I have done experiments on them and I am willing to admit that—as a matter of fact, I am convinced it will happen—don't publish that last statement in any scientific paper—I think it is certainly true that I can get a response to the administration of a symbolic stimulus and the subject cannot verbalize to me why that disturbance had occurred.

In lay language, he will say: "No, I am not emotional about this." Under certain circumstances—and as with the polygraph, I will not give a figure, I don't know how common the occurrence is—under certain circumstances persistent and skillful questioning might reveal that this symbolic stimulus had some special differential significance to the individual.

In this case, we say, it was unconscious and we were very bright because we gradually made it conscious. To be modest about it, under an equally large number of circumstances, we will not be able to elicit the special differential significance of that wiggle on the page.

Sometimes extensive investigation may tell us, may convince us we know why but that is no more proof than is a confession, let us say, unsupported by other things.

Have I answered your question, Mr. Meader?

Mr. MEADER. Well, I am not sure.

Dr. LACEY. It is such a difficult question. Let us say this. Unconscious thoughts—and we will accept the meaning of that—can be revealed on the polygraph but deciding that they have been so revealed is as knotty a question as deciding on the validity of the polygraph. Does that answer the question?

Mr. MEADER. Let me reread Dr. Dearman's statement:

> However, this is of little or no avail because the examinee does not realize that not only will his conscious thoughts and his autonomic responses to them be recorded but his unconscious thoughts will also be delved in and consequently he will give autonomic responses to unconscious thoughts.

I take it you agree with that statement?

Dr. LACEY. No, sir. He may give autonomic responses to stimuli which in one school of thought at least is labeled as an "unconscious thought."

I am sorry, I don't want to be unresponsive, but you are touching on very difficult questions of interpretation, theoretical languages of different people.

Mr. MEADER. Are you saying there is no such thing as an unconscious thought?

Dr. LACEY. No, sir; I am saying there is disagreement about this. Let me try it again. Accepting the concept of an unconscious thought, and incidentally I do, as Dr. Orne, at least, knows, accepting that concept it is possible to get physiologic disturbances, when one administers symbolic stimuli related to this complex of feelings. But it is also possible not to, as is documented in both the experimental literature and in the psychoanalytical literature.

May I give you an example?

Dr. Franz Alexander, a very eminent analyst and one who has spent a great deal of time investigating physiologic responses in his patients—I think I have the right paper——

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Dr. ORNE. Yes.

Dr. LACEY (continuing). Was studying—my memory is a little vague, he was either studying blood pressure or gastric secretions in a fistula patient. He was studying blood pressure generally, and after the intensive investigations of a single case, followed by investigations of others, he said that the physiologic responses have to be interpreted in the light of a long sequence of seven or eight different judgments that had to be made. Perhaps Dr. Alexander could make those judgments. I certainly could not. He gave one very interesting example concerning patients engaged in defensive maneuvers, who may misperceive what you are saying, may misperceive the import of their environment. This may be a definition of a psychiatric patient.

Dr. Alexander's words were, I believe, something like this: If the patient develops a delusion of mastery, if he feels that he has things licked, that he understands what things are all about and he temporarily feels comfortable, then you will not evoke a physiologic response when you discuss this tender sensitive network of interpersonal and intrapersonal relationships.

Here, then, are unconscious thoughts. Here, then, is the mobilization of a variety of attitudes and defensive maneuvers which eliminate the physiologic response.

Perhaps I can make this even clearer in something that is a lot simpler to describe.

Dr. Dittes did a study in which he was evaluating the GSR as an indicator of the course and progress of psychotherapy. In discussing sexual matters with his patient, he observed, no surprise to any of us, that there was quite an increase in the rate of GSR as one began to approach the sexual problem and delved into a discussion of it. Again, no problem. The simple and obvious interpretation is: see how upset this subject is, how involved he is with sexual problems. Here is a physiologic indication that this is a problem to him. He has a homosexual problem, let us say. Very careful ratings by independent people, independent observers, were made of the therapist's attitude that day, that session, and, even more dramatically in short intervals of time—say the last 10 minutes. As you observe a therapist and a patient interacting, you will observe that the therapists, themselves, even the best trained of them, exhibit a change of mood, exhibit disapproval, or at least the patient feels he sees some disapproval or approval. The therapist can be very gentle with his patient; lower his voice, select the most innocuous of words to keep the patient talking, or the therapist's voice rises, for example, and he rephrases in a very sharp manner what the respondent is saying.

Let us call the variable gentleness and friendliness. In the exploration of sexual matters, in 10-minute segments during the interview when the therapist was gentle and friendly, the GSR's were not evoked. In 10-minute segments, where the therapist shifted a little bit—mind you these would not be tremendous shifts, a trained therapist does not change from a friendly, accepting, understanding, wise person to a hostile interrogator in the course of 10 minutes. These are subtle changes. Such subtle changes in his behavior, which move away from gentleness and friendliness, increase the GSR rate.

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What are we observing? Conscious and unconscious thoughts? Or are we observing the response of the organism to the total social interpersonal situation in which he finds himself?

Dr. Orne has documented that he is responding to the total situation, to his perception of the total situation.

Drs. Silverman and Cohen, two psychiatrists, were able by being gentle and friendly to decrease the violent autonomic response to the word "vagina." In the same interview, however, they did nothing when the word "intercourse" came up. A week later, when they took the patient in and administered the analog of the lie detector test, gave him a word association test, the word "vagina" elicited no GSR. The word "intercourse" elicited just as strong GSR's. In other words, an hour's manipulation of the "emotion" surrounding a single word, diminished the response, whereas the related word had just as big a response.

Now, both elicited many unconscious thoughts in psychoanalytical lingo—one elicited as many as the other.

The polygraph in physiological measurement reveals physiological changes. These physiological changes are known to be a function of a great variety of variables, not simply unconscious effects, not simply response uncertainty, not simply anything you want to name.

Dr. DEARMAN. But you can't rule out the unconscious part of it, can you?

Dr. ORNE. You can't rule it out, you can't rule it in.

Dr. DEARMAN. I agree. You can't rule it out, you can't rule it in, but you know the possibility is there. You know the possibility, you don't accuse the man of something he didn't do.

Dr. ORNE. That could be jumped at. I think if we went from the issue of what it could be to the question of false positive, which I think is a statistical issue that can be researched on that basis and only on that basis, I think that we tend to mix moral issues with empirical data which is available or needs to be available.

What I am trying to do is separate the empirical questions which can be researched and need to be researched from moral ones on which decisions have to be made by people other than research workers.

Dr. DEARMAN. Would not an emotion have two components, a psychic component as well as the physiologic component?

Dr. ORNE. You can't pick up the psychic component on the polygraph.

Dr. DEARMAN. I agree. All he knows is the blood pressure, pulse, respiration, and the GSR. That is all he knows.

Dr. ORNE. Actually, he also observes——

Dr. LACEY. He should know more than that. He should know what stimuli are being administered, what kind of contact.

Dr. DEARMAN. Yes. I am talking as far as reading the polygraph. It tells him nothing about what type of emotion produced this. Are any emotions really true emotions? Do you get an emotion of love, fear, or an emotion of fear, anger? The guy that is stopped by a policeman for running a red light, this fellow usually gets angry, mainly because he is frightened. So you have two emotions.

Dr. ORNE. Nobody would argue that you cannot separate emotions, that you get into very difficult scientific issues when you try to do so.

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Dr. DEARMAN. We need to do this. This is important.

Dr. LACEY. No, many feel we need never consider this concept.

Dr. ORNE. This is exactly it because we can do this on a strictly empirical statistical basis. If you base your judgment on one case, you have a lot of trouble. We also did research on psychotherapy on polygraphs. These were not lie detector polygraphs but sophisticated instruments where we had both the therapist and the patient in the polygraph.

You may recall the work. We can document the kind of phenomena that Dr. Lacey talks about nicely. It was not merely the content that was talked about, the therapist changes. His activation level had a lot to do with how the patient responded. This is why we emphasize so much. It makes a difference how you ask your questions. There is no doubt about this. I think if you get a situation like "You drink coffee?", which is your example, and you get a big response to it, there is no question that this is an idiosyncratic response which is related to something in the man's past. This is an inference but is one on which I think most people will agree. It is a kind of commonsense inference.

Dr. LACEY. That is right. It is something you can find.

Dr. ORNE. Right. Now, let us say we have not 1 question but 50 questions which we ask, of which, let us say, 10 relate to information that the individual should have or would have, if he is guilty of something, and 40 do not relate to it. You are going to get among these 50 questions a couple of random idiosyncratic responses because of past associations. There is no doubt about that. But the odds are very high they should not come only on those 10 questions. They should come randomly distributed and wash out in this much data.

If you get significant differences between these 10 and the other 40 which should be about matched in an emotional content, which should be asked the same way, then you have a fairly solid basis for saying something is going on in these 10 questions which is different from those 40 questions.

If you know enough about the individual's past that he could not have known this information except by being involved, let us say, and you know it was asked in such a way that these questions should not evoke a different response in a random individual, then you have fairly strong bases for statistically saying, this individual is responding differently, therefore he must know something.

Dr. LACEY. No. This guy is responding differently, therefore, something is going on.

Dr. DEARMAN. Exactly.

Dr. LACEY. It may be guilt, it may be some distortion, such as Dr. Dearman described in that one case.

Dr. ORNE. No. Something is going on not in terms of his individual idiosyncratic past but in terms of his having this knowledge. You would have to know more about the situation before you can make the next jump but you can make this statement that he has more knowledge than he should have.

Dr. DEARMAN. How do you know he has more information about this particular situation you are questioning on? Why could it not be a similar situation in the past?

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Dr. LACEY. Really, Dr. Orne, let us take Dr. Dearman's case. The polygraph was correct. The diagnosis of guilt was an incorrect inference.

Dr. DEARMAN. Yes; it recorded properly what it was set to record.

Dr. LACEY. The bank examiner said that is nonsense, such a theft was not made. Only then with that kind of background information you go back and say, "Look, you did not steal from the bank. What is going on?" That is what we meant before when we said the physiologic disturbance is just that.

Mr. Moss. Gentlemen, I would suggest that in order that we avoid anxiety over a possibility of a lunch break that we now recess until 2 p.m.

(Whereupon, at 12:30 p.m., the subcommittee recessed, to reconvene at 2 p.m.)

AFTERNOON SESSION

(The subcommittee reconvened at 2 p.m., Hon. John E. Moss (chairman of the subcommittee) presiding.)

Mr. Moss. The subcommittee will be in order.

I believe when we recessed, we had a very interesting discussion going on, but we cannot resume with it immediately, because Dr. Lacey is necessarily delayed in returning to the committee.

Dr. Orne, you indicated that under certain conditions, for security considerations, where information is needed, or additional information is needed, you felt there was some justification for using the polygraph technique as a preemployment screening procedure.

Is that correct?

Dr. ORNE. Yes, sir.

Mr. Moss. Generally, do you feel that the polygraph should be utilized as a preemployment screening device?

Dr. ORNE. As a personal view—both of these are obviously personal views—no.

Mr. Moss. On the basis of your knowledge of techniques currently employed in the field, not in the laboratory, in general screening for preemployment, has it validity?

Dr. ORNE. I again would like to separate the two aspects of validity.

If you ask the question: Is it accurate?—it is certainly better than chance. I am convinced of that.

Mr. Moss. Better than what chance?

Dr. ORNE. Better than just flipping a coin. In other words, if you were flipping a coin and on the basis of that were making decisions, where you would be right half the time if it were a two-way choice—it is appreciably better than that.

Now, how you are going to use it should be an administrative kind of a decision, depending upon the stakes involved.

If I could, I would like to just try to spell this out perhaps a little more, because I think it is a basic point, which tends to be overlooked.

The use of the polygraph allows you to come to a kind of statement about the probability that a given individual believes what he is talking about. Now, that is all you get, really, a probability that this is so.

You can then choose to accept for different purposes different kinds of probabilities. Provided you think of it in this way, there are un-

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doubtedly some positions in the Government where it is vital for the security, let's say, that we do not pick somebody who is a wrong person, for whatever reasons.

Let's say that there are a thousand people applying for 10 jobs, so that we have got a very high rate of selection that we need to do. Given an instrument of a relatively low degree of accuracy, let's say one that is accurate 70 percent of the time, instead of 50 percent of the time, that would be chance——

Mr. Moss. The instrument is accurate each time, is it not?

Dr. ORNE. The instrument always gives you data, but the determination, in terms of "if you knew all the facts," whether a person really believes what he is saying, will be accurate 70 percent of the time, compared with what it really is.

Now, this is not a very highly accurate tool. It means that you are batting 70 percent, instead of 50 percent, which would be a chance thing.

However, if you have to pick only 10 people out of a thousand, let's say, you can, even with such a poor instrument, with a very high degree of accuracy, pick 10 people, where it is highly improbable, very improbable, that any will belong to the wrong category.

Mr. Moss. Doctor, how do we know if I flipped the coin I would get 50 percent, rather than 70 percent? Would that not depend on the kind and the manner of flipping it?

Dr. ORNE. Oh, yes; I am assuming an unbiased coin flipped in an unbiased way 70 percent of the time.

Mr. Moss. But I could get that with a coin.

Dr. ORNE. Yes.

Mr. Moss. And I might get less than that 70 with operator A rather than operator B?

Dr. ORNE. Yes, certainly.

Mr. Moss. To your knowledge, has anyone in the commercial use, the Government use, the nonresearch or professional use, of the polygraph, undertaken any studies which would be valid as statistical indexes of results?

Dr. ORNE. The studies of commercial lie detection? Is that the question, sir? None that I know of well enough so that I would be comfortable about saying that I would trust the statistics, no.

Mr. Moss. Dr. Kubis, do you have any view with regard to such studies?

Dr. KUBIS. No. The only data that are available, which is a large body of data in terms of numbers, is from the Keeler group, which I think now are the Reid and Inbau group. They have been publishing these statistics since they have been editing their book on lie dedetection. There is a fairly large group of data there on non-Government statistics with regard to lie detection.

I do not know, but I think there should have been, if the Government is using it in certain of its operations, a periodic check on the accuracy of this work. There must be some sort of data, some sort of feedback, or these people would not feel confident in using such an instrument.

Mr. Moss. What criteria should be utilized as a minimum in making such a recheck in order to develop meaningful and reliable statistical information?

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Dr. KUBIS. There are various numbers that are used to develop statistical significance. For example, there are numbers like 10 percent error, 5-percent error, 2-percent error, 1-percent error, that may be tolerated.

The selection of the error that you wish to tolerate in the procedure depends upon the seriousness of the material that you are working with.

I should like to have an error of much less than 0.00001 percent of the times that this object, which may have an atomic component in it, will not explode by itself. I would want terrifically high significance, which means very low probability that this should explode.

Therefore, if we are dealing with security cases, important cases, I think that the probability of error should be very small.

If people want to deal with some other types of cases, and they have to use such an instrument—assuming it is legal—then the error in such instances can be larger. In other words, the error that I would be willing to accept or anybody would be willing to accept could be larger.

It all depends upon the seriousness of the mistake that you would be willing to tolerate.

Mr. MOSS. To see if we can tie this down, let us look at the staff report, the table on the use of the polygraph as "lie detectors" within the Federal Government.

Let us take, for example, the Department of the Army, military intelligence, and military police. And during the year 1963, military intelligence conducted screening examinations on 8,094 persons, and military police conducted criminal interrogations on 4,400 persons. And let us confine ourselves to the 4,400 tests performed in the course of criminal investigation.

Now, at this moment, we have one statistic, 4,400 persons were given tests, or, to make it more precise, 4,400 tests were performed, because we do not know that the tests were performed in each instance on a different person. We did not seek the number of persons involved.

But what have we developed, or what can we develop, statistically, from the 4,400 tests given, and in making an analysis to produce something of significance, what criteria should we impose for that analysis?

Dr. KUBIS. It is a matter of damage to the person in case of a mistake. If it is a criminal case, say, that he is accused of a crime, the mistake there will be damage to his reputation.

I feel, in terms of military cases where there may be damage to one's reputation, there should be a very small percentage of error, if that report is going to have a lot to do with the final judgment on the case.

If it is purely advisory, and if we have no other ways of determining the guilt or innocence of this individual, then perhaps the lie detector can give some added information.

Mr. MOSS. But it cannot determine the guilt or innocence.

Dr. KUBIS. It cannot determine the guilt or innocence. No lie detector does this. It can determine whether he will believe or whether he does not believe what he is saying, provided the examiner makes a correct judgment.

Mr. MOSS. Does it even determine that? Can he honestly believe what he is saying and have an autonomic response indicating that he does not believe what he is saying?

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Dr. KUBIS. There will be a number of errors of this sort. There will always be errors in using a manmade instrument. In general, though, with the use of lie detectors you will be identifying such individuals who are speaking contrary to their mind in a larger proportion of cases than if you had not used this instrument.

You may say: "I think he is guilty, from the way he is answering this question. I feel he is not telling the truth." Now, if we took an independent judgment on this, and we took a person who is skilled in the use of a lie detector, the lie detector examiner would, with greater degree of accuracy, be able to determine whether the man is telling the truth or is not telling the truth.

Mr. Moss. Well, we want to find out what percentage of these 4,400 cases were accurate.

Dr. KUBIS. That should be in their records of those that have been verified. There will be a large number that have not been verified.

Mr. Moss. Well, you say that the claimed accuracy rate of the instrument is about 70 percent, so there would be about 3,000 of these cases, where the operator and the machine arrived at a conclusion. It could be a conclusion of guilt or a conclusion of innocence.

Dr. KUBIS. Or whether he believes what he is saying, or does not believe what he is saying.

Mr. Moss. No. In the field, does the average operator report that he believes what he is saying, or does his report indicate that he, the operator, concludes that the person is not telling the truth?

Dr. KUBIS. Usually, I believe that most operators think in terms of guilty or not guilty. But a careful operator will say, "In my judgment his records are similar to those who, in the past, I have known to have lied."

Mr. Moss. Then one of the first things we would have to do is run a study on the operators.

Dr. KUBIS. Yes. You would have to know the accuracy of each operator.

Mr. Moss. And would we also have to know whether the operator is the person who normally believes what he says, or whether he is a person that might on occasion be confused. Should he have a test?

Dr. KUBIS. I would think that if he is an ordinary individual and has a record of honesty, is an upright gentleman and has always been so, we have to, on the basis of our ordinary dealings with people, assume that he is a reasonably honest person, and that he will not do something that is unusual. We will have to accept on face value that he is an honest individual.

Mr. Moss. In other words, we would grant to the operator something we would not grant to the examinee, an assumption that he is at that point a reasonably honest individual, and that he believes what he says.

Dr. KUBIS. Merely from this point of view, he would have to be examined, because there is sufficient evidence that has been gathered that he is likely to have been connected with the crime.

Mr. Moss. Should we know something about his personality traits when he is in that booth, along with the examinee?

Dr. KUBIS. Yes. We should. If the examination is well conducted, we should know quite a bit about the examinee.

Mr. Moss. After the operator is convinced of the infallibility of this device, this multigraph gadget——

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Dr. KUBIS. He belongs someplace else. He is God, then. Unfortunately, this is the tendency in some beginners.

Mr. MOSS. It would probably surprise you, or maybe it would not, to learn that as chairman of this committee I have had many communications in recent weeks from men who assure me that this is "a most reliable, scientific device." These are men who are engaged in commercial polygraph activities all around this country who, in their communications, indignantly charge that I am attempting to destroy them.

Dr. KUBIS. These men have an ax to grind.

Mr. MOSS. Well, if that is their conviction, how objective will be the job of interrogation?

Dr. KUBIS. This is the matter of training that you brought out this morning; namely, that we should know something about the individual and how good he is both morally and in terms of capability and training—scientific training.

Mr. MOSS. The operator is very important, then?

Dr. KUBIS. Exceedingly important, because the machine does not say a thing. It is the operator who does the work.

Mr. MOSS. All right; can we then make an analysis of the results obtained from these 4,400 cases, without knowing considerably about the 205 polygraph examiners who gave the tests?

Dr. KUBIS. No; unless they have kept records.

Mr. MOSS. Have they kept records?

Dr. KUBIS. Probably they have records on the verified cases. As for the others, I do not think we can make much of a judgment.

Mr. MOSS. But can you make an analysis of this, pointing to the accuracy or reliability, without taking into account all of the cases?

Dr. KUBIS. All of the 4,400? No, you cannot; because some of them will not have been verified.

Mr. MOSS. And normally, the ones that are felt to be truthful or innocent will not be followed up after examination, will they?

Dr. KUBIS. Normally, no.

Mr. MOSS. If the person breaks down and confesses, is that a positive result even though it might be a false positive?

Dr. KUBIS. This is rare—that the man confesses to a crime and he had not committed the crime. This is rare, in general.

Mr. MOSS. What statistics do we have on that?

Dr. KUBIS. Only the publicity reports that appear now and then. Roughly about once or twice a year you get a case where the man has confessed, and then he retracts his confession.

Mr. MOSS. And then we get those that make the newspapers?

Dr. KUBIS. That is right. But usually a man who has not committed a crime will not deliberately admit that he has done it unless he wants to show up a procedure. He may do this as a test case.

Mr. MOSS. I regret that I am not going to be able to pursue this, although I hope to either later in the afternoon or tomorrow morning. I have another meeting right now.

Mr. Reuss, would you take over?

Will you gentlemen pardon me?

Mr. REUSS (presiding). Mr. Monagan, do you have some questions at the moment?

Mr. MONAGAN. I have just one question.

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Speaking about the advisability of the procedure in broad terms, you have cast some question upon its validity in various aspects; largely, as I take it, on the basis of its reliability as a technique.

Do you have any question, based on broader philosophical considerations, of the degree to which this procedure invades, or may invade, the privacy of the individual?

Dr. KUBIS. With respect to myself or the group?

Mr. MONAGAN. Anybody that has any opinion about it. It could be raised in connection with criminal cases, but I think it is more applicable in the preemployment situation.

Dr. ORNE. As a private individual, for example?

Mr. MONAGAN. Yes.

Dr. ORNE. Certainly I do, and I think all of us have very real concern about many developments in technology, and the potential implications, and I think the ones here are very real, as real as, for example, wiretapping, which I brought up, which concerns me very seriously.

Mr. MONAGAN. This is not quite as bad as that, because that is usually totally involuntary, and at least for the outward manifestation of this, you do have consent.

But I think it has previously been suggested that there may be byproducts that are not foreseen in the course of investigation, and we are so sensitive, now, to the invasion of privacy in so many ways that I just wanted to ask that question.

You are dealing with this all the time in the laboratory in a very practical way, but I wondered if you had some feeling about the broad implications?

Dr. ORNE. I think there are real implications, and the problem of safeguarding the individual is a very concrete one and a very real one.

I think that equally so, probably if there were a situation involved where the real security of the country is at stake, provided the individual is still safeguarded—this is a big "provided," because the end does not justify the means beyond a point.

But I think, then, under these circumstances, if it is a position which involves very sensitive security things, just the same way as you would exclude some people on the basis that maybe they had a friend that people are unhappy with.

Now, this is really unreasonable—that you should exclude somebody because he has the wrong friend—and it bothers me. But I still cannot argue with it as long as it protects an individual.

Mr. MONAGAN. You get back more or less to the same balancing of the interests that we were talking about before, except that, you do feel that, in addition to technical defects, this possible invasion of individual rights or prying or whatever you want to call it might be an important consideration, depending upon the importance of the interests involved.

Dr. ORNE. My only comment on it would be that I think none of us here—none of the four of us—would be any more expert on this particular issue than any other four individuals that you would happen to ask.

Mr. MONAGAN. I realize that, but I just wanted to ask you.

Thank you, Mr. Chairman.

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Mr. REUSS. Gentlemen, I wanted to clear up what was a little confusing to me in the record this morning, a matter having to do with the claimed percentage of performance on these polygraph tests. Both Dr. Orne and Dr. Kubis mentioned the figure of 75 or 80 percent.

When you used that figure, you were talking about laboratory tests, and you were not talking about actual lie detector tests on real people, were you?

Dr. KUBIS. That is right. These were laboratory figures.

Mr. REUSS. And so far as any member of the panel—any of you four members of the panel—know, the actual verified percentage of success of lie detector tests actually undertaken for employment screening or wrongdoing detection purposes is negligible?

Dr. KUBIS. The amount of verified material—the only source I know is the Chicago group.

Mr. REUSS. The Chicago group includes Mr. John Reid?

Dr. KUBIS. That is right.

Mr. REUSS. Now let me ask Dr. Orne of Boston about that.

Mr. Lawrence A. Gustafson is a member of your staff; is he not?

Dr. ORNE. Yes.

Mr. REUSS. Are you familiar with the article that he and some colleagues wrote in the December 1962 Harvard Business Review, entitled "Don't Trust the Lie Detector"? (See pt. I, hearings, p. 147.)

Dr. ORNE. Yes.

Mr. REUSS. You are familiar with Mr. Gustafson's studies?

Dr. ORNE. Yes.

Mr. REUSS. And are you familiar with the portion of that article which deflates the Chicago school claim of 95 percent accuracy?

Dr. ORNE. Very much so.

Mr. REUSS. I will read you from that article by Mr. Gustafson and his colleagues, and I quote:

"These figures"—and here he is referring to the 95 percent claim of accuracy of the Chicago school—

> leave us with no information at all as to the correctness of "reported guilty" in about 40 percent of the cases, and with no such information at all in almost 90 percent of the reported innocent cases. This is a far cry from the claim of 95 percent accuracy. Most of the claims by others for the effectiveness of this method are not even documented with the number of cases.
>
> What it all adds up to is that aside from the misleading figures of Inbaue and Reid and a few others, there exists no public body of knowledge to support the enthusiastic claims of operators. There are no publications in reputable journals, no facts, no figures, tables, or graphs. In short, there is nothing to document the claims to accuracy or effectiveness except bald assertions.

Would you agree with that statement by Mr. Gustafson?

Dr. ORNE. I would say that this was done before we embarked on some laboratory research. I think that Dr. Gustafson as well as I have the view now that there is laboratory data, reliable laboratory data, available, which shows that this works certainly significantly better than chance.

Mr. REUSS. However, that laboratory data has nothing whatever to do with the actual performance outside the laboratory of the lie detector, does it?

Dr. ORNE. Not quite. It does.

Dr. Kugelmass has done a study in Israel, using Israeli police cadets, in some staged real life situations. This is still a laboratory

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type study, except it was done in life. The cadets did not know it was a study.

And it is the type of thing which I do not think we would have done, that he was able to get the corporation to do, because apparently this was of real concern to the Israelis for practical reasons.

Mr. REUSS. Outside of this one study by Kugelmass of Israel, spelled——

Dr. ORNE. K-u-g-e-l-m-a-s-s.

Mr. REUSS. Aside from this one Kugelmass study, is there any evidence whatever of the effectiveness of lie detector tests outside of the laboratory?

Dr. ORNE. We can only extrapolate from the laboratory.

Mr. REUSS. I wish you would answer my question. Your answer is "No," I take it.

Dr. ORNE. "No," yes. Yes, the answer is "No."

Mr. REUSS. Will you furnish for the record the Kugelmass study? Did he write up a paper on this?

Dr. ORNE. I do not have it with me, unfortunately.

Mr. REUSS. Is it in a monograph form?

Dr. ORNE. I do not believe it is yet published. It was a report that I saw. The reason why it was relevant was that he used some of our procedures, which were lab procedures, in a much more real life-like situation, and came out with data much like ours in terms of percentages.

And it is on the basis of this type of thing that I have somewhat more confidence in a laboratory study if it holds up in this kind of quasi-field thing.

Mr. REUSS. You fortunately soften things with a "quasi," because this is still a laboratory test.

Dr. ORNE. Yes.

Mr. REUSS. The Israeli police officers were presumably good guys rather than bad guys, were they not, and hence this was not in any sense a field experiment?

Dr. ORNE. No. It was a staged situation, of course.

Mr. REUSS. In connection with this, Dr. Kubis, I have looked at—not as thoroughly as I would have liked to and shall when I have more time—your report, "Studies in Lie Detection," dated June 1962, and prepared for the U.S. Air Force.

In there, you looked into whether you could substitute a computer for the live operator—a study in which, to my relief, you came to the conclusion that however worthless a live operator might be, a computer would not improve matters very much. You also reported on a laboratory-type study you had made at Fordham.

Dr. KUBIS. That is correct.

Mr. REUSS. Here again I want you to correct me if I either misread or misdescribe it, but am I right in thinking that you set up an experiment in which you got various Fordham students, and you asked one of them to play as if he were a murderer——

Dr. KUBIS. A thief.

Mr. REUSS. A thief. Perhaps I should let you tell me just how you set up this experiment. Were there three people involved?

Dr. KUBIS. There were three people involved.

Mr. REUSS. And who were they supposed to be?

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Dr. KUBIS. One was to take the role of a thief, the other of a lookout, and a third of an innocent suspect. And the third person did not know the identity of the other two. He was brought in later. He could not identify them. They never knew him, he never knew them. Consequently, he was innocent even of what was going on and the identity of the two people who were engaged in the experience.

In this case, the thief was supposed to take money, and he actually had to take money, from a receptacle which contained religious material. And if the group knew the feelings about Catholics as to invading religious types of material and opening up and taking money from an object that has religious connotation, the group would realize that this sets up a number of tensions within such an individual. He does not like to do this.

Some of them did not want to cooperate. Another, when he came back, fainted right before he took the examination. Enough emotion or tension was generated by this experiment. Several of the subjects came running back and said there must have been some people following them, because they did not want to be caught in this.

So the experiment provided enough tension and enough feelings of uneasiness, when they were taking this money while the lookout had to be sure that no one was around. So in a sense it was a well staged experiment, realistic, but still staged.

Mr. REUSS. Without in any way deprecating the experiment as a laboratory experiment, it did suffer from at least this defect, did it not, as presumably all laboratory experiments with live bodies would: All three of the bodies involved knew that they were lying like hell, did they not?

Dr. KUBIS. When they denied taking the money, or acting as a lookout.

There are a number of questions that were asked. Some were concerned with the taking of the money, opening the object, forcing it open. Other questions asked whether the subject was an accomplice.

In this way we were able to set up a number of questions that would discriminate the thief from the lookout, the thief from the innocent individual, and the lookout from the innocent individual.

Mr. REUSS. I do not want to bring religion into this discussion. That is the special province nowadays of the Judiciary Committee. But in this connection, and having in mind the fact that Fordham is a Jesuit university, and that many of its students are Catholic, and apparently those in this study were, was any thought given to whether tension might be caused about participating in a study whose purpose was to see whether the ultimate subject, truth, might in fact be obtained by clamping things to people's arms, chest, and fingers, and then taping the results into a computer? Did that bother anybody? In their bull sessions?

Dr. KUBIS. Yes; it did bother some, and some did not continue with the experiment. Later on, we found out that those were the ones who were suspected by their fellow members of pilfering books from the bookstore. Those did not continue.

One person was sent to an infirmary, because he felt ill, and the other fainted, right before the examinations.

Dr. DEARMAN. So you would have to say, then, that something in their past life was reactivated, would you not?

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Dr. KUBIS. I do not know whether it was something in their—I would say in any person's behavior, there is something of his past in that behavior. This is universal. I think we could say that about any of our actions. We are the living history of our past as we exist right now.

Now, what we have to distinguish is whether that past has been significantly connected with the present incident.

Dr. DEARMAN. Yes. And the boys who could not carry through with the experience were suspected of stealing books, were they not?

Dr. KUBIS. One of them. The other two were not. But they could have been scrupulous individuals. Having once entered the experiment, they may have felt that they were lying, and this may not have been good, so they evaded the situation by fainting and getting sick.

Mr. REUSS. Let me ask you, Dr. Kubis, and the members of the panel, this question, which reflects my own bewilderment at the whole investigation we are conducting—of the occult art of polygraphing: I am amazed that here in this advanced democracy, for the last 40 years, the polygraph has been going great guns throughout the country, so that today—the security agencies aside—the U.S. Government itself applies some 20,000 polygraph tests a year, and Lord knows how many tests are applied in industry. Yet, so far as I know, nobody has ever made a study of the actual lie detector cases to see whether, not in the laboratory or in the quasi-laboratory, but in the field of activity, they are in fact worth anything or not.

I recognize difficulty in such field tests, but why could not honest and competent social and physical scientists like you four gentlemen, for example, take the material of let us say last year's 25,000 Government tests and see in how many of those incidents the crime was in fact solved—we know who stole the stuff from the warehouse, whatever it was—and then see how that matches with those that the polygraph found innocent and those that the polygraph found guilty?

This has never been done, has it?

Dr. ORNE. And it needs to be done.

Mr. REUSS. And until it is done, this whole occult art is entirely unproved, is it not?

Would anyone disagree with what I have said? I am just trying to reason it out with you.

Dr. KUBIS. I think it should have been done. I think there should be a self-checking procedure in any such agency so that they have a continual reevaluation, not only of their procedure, but of their results. The results will indicate possibly what went wrong with the procedure.

But unless this is done, they may be perpetuating a number of errors that they have not corrected, because they have not examined themselves in this manner.

Mr. REUSS. I am glad that you gentlemen share my amazement that here we keep on applying this practice without having done what it seems to me science requires us to do, which is to see whether it works or not. And there are ways, not infallible, but better than doing nothing about it, to see whether it works.

Dr. Lacey, did you have anything to add?

Dr. LACEY. I was just about to say: The field of "lie detection" has not been one which has attracted the attention of a large number of scientists.

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In my own field of psychophysiology and neurophysiology, for example, I doubt that there is a handful of people who have given it more than casual attention. Dr. Kubis is one of the exceptions. He got interested in it early and has been working on it. Dr. Orne got interested in it recently.

The field of lie detection has been in the hands of people who have trained themselves, gotten whatever help they could get, I am sure, and have developed outside of the confines of any of the recognized scientific disciplines, or professions.

This I think accounts for the lack of the kind of scrutiny that you are calling for.

I think more interest is being engendered these days, simply because it has come to be such a widespread practice, and because there are now some theoretical interests which now interest scientists. Scientists do not work unless there are some theoretical interests.

The study that you are suggesting is not an easy one, and it would involve some very careful planning.

I would like to say that the scrunity of past records is not as likely to be effective as what we call a prospective study, where, from the very beginning, a group of knowledgeable people get togther, plan a study, set forth criteria, a population to be studied, the circumstances under which data will be collected, and so on.

Going back over statistical data can be very misleading.

Mr. REUSS. If I may interrupt you, though, would it not be a good idea to do both? Would it not be a good idea to send a team of competent and honest practitioners, some of them medical doctors and psychiatrists, some of them psychologists, some of them simply intelligent generalists, and in addition to the prospective study that you talk about, sending them to look at the results of last year's 20,000 tests in the Government?

Go back 2 years. Leave out the cases where no resolution has been had of the mystery, but take the cases where we now know by extrinsic evidence pretty well what happened, though this takes some evaluation, and then go back over the files.

What did the polygraph operator say was indicated about suspects A, B, C, and D, and rejects C, D, E, and F? I do not see why that would not be a useful part of a study.

Dr. LACEY. I guess I was just prejudging the case, having similar experiences, that one would not be able to come up with much decisive information.

Mr. REUSS. But coupled with the prospective study that you are talking about, would not the two of them enable us to proceed with much more wisdom and certainty than we now have?

Dr. LACEY. I think the retrospective study might serve the purpose of familiarizing the investigators with the difficulties involved in setting up a prospective study. It would be sort of a field study, a pilot study, to see what would have to be controlled and thought of.

I do not think any decisive information would come out of it. I mean this has been the history all the time, of retrospective studies of this kind.

Mr. REUSS. Dr. Orne?

Dr. ORNE. There are a number of reasons for what Dr. Lacey says. We would like to find out, in some study of this kind, what the real accuracy rate is, due to the instrument. Unfortunately, in the life

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situation, the operators are given a great many hints by the people around them, and you would have to set up a study, for example, to separate the data which you get from doing this test from other data which may be helping or hindering.

Odds are you would, for example, get a higher accuracy rate than the real one in a retrospective study, because I am sure that the operators are getting all kinds of leads.

There is one other point——

Mr. REUSS. I guess I should stay with you on this retrospective study a bit, because I am not sure I understood you.

Let's just invent a case. Let's suppose this involves the U.S. Army, and at Camp Gordon, Ga., of all places, a case of beer was missing from the officers' club, and they got all the boys in barracks 60 out and did whatever polygraphing they do. And either because someone confronted with the polygraph broke down and told all, or because by more normal police methods they later caught and court-martialed the stealer of the goods, the case has now been determined. And let us assume that an independent judgment confirms that it was probably decided rightly, that the person who was found guilty really was, that the circumstantial and other evidence was conclusive.

Then I should think it would be useful to go back over the investigatory file and look at the polygraph papers with the squiggles on them and the notes of the operator, and see what he had to say—which ones of the 40 people given the polygraph test did he think were guilty, and which were innocent. And I should think it would be very helpful to go back and look at that.

Now, is there anything wrong with this approach—coupled, of course, with the prospective study which has been mentioned by Dr. Lacey?

Dr. ORNE. Certainly it would give you data which would be interesting, and I think you have to separate what you are trying to find out.

I think everybody would agree that this should be done, that you should have a look at it.

I think most of us, however, would feel very cautious about interpreting this data, because if you were there, probably you found out that the man who did the polygraph examination did it after having lunch with a fellow who picked up the man whom he was polygraphing, and who told him: "You know, I think I got the one."

Now, if you had a tape recording of it, you would find that this polygraph examination may have been a very different kind of an examination than another polygraph examination.

And even if you look at the wiggles of a pen, as I tried to point out, in the way you ask the question you can make the pen wiggle.

Mr. REUSS. Well, what you are saying, Dr. Orne, comes close to saying that the polygraph is of absolutely no value. What you are saying is that even where it purported to establish that it was efficacious in a particular case, it may well not have been, because the polygraph operator relied upon extrinsic evidence. Thus he pronounced a given set of squiggles as guilt indicative, when, in fact, the same squiggles might have led him to pronounce the man innocent if his extrinsic padding around had shown that probably the fellow had a pretty good alibi.

Is that not about what you are saying?

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Dr. ORNE. No, sir. First of all, if this were the only problem, we would be in fine shape. I am worried about the fact that even the squiggles of the pen, which after all we might still be able to look at, might be affected by this extrinsic knowledge.

However, and this is where the laboratory comes in, there are reasons why we do laboratory research, namely, we can control these variables, we stay up nights working out how to control them. And then our colleagues come along and tell us we have not done it completely, so we re-do it.

But you do have control of the situation, so that you can then ultimately get at the mechanism involved.

Now, what we would really like to know—and it is my suspicion that in a life situation, if you control the variables, we could separate out, without too much trouble, by doing the proper research, to what extent you can really get the data from the polygraph record, as opposed to prior knowledge.

It demands certain conditions, surrounding the polygraph situation. It demands that the polygraph examiner has no data about the person, but certain data about the situation. And it would have to be very carefully worked out as to just what data he has.

And only if you did that—and this is what Dr. Lacey is trying to say, I think—in a prospective study, could you then trust where the decision came from.

Mr. REUSS. Well, now, let me pursue this a bit more with you.

Suppose, in our retrospective study for the year 1960, let us say, of this hypothetical case at Camp Gordon, the records, that is, the sheets with the squiggles on them and the notations of the polygraph operator, said that suspects A, B, C, D, and E, whom I have examined, are innocent, because there was no pronounced wiggling of their——

Dr. LACEY. Squiggles?

Mr. REUSS. Of their line; and attached and appended hereto are the questions I asked him, which I carefully preserved for all posterity, being an honest, scientific polygraph operator.

And then suspect F—the polygraph operator's notations indicate—looked awfully guilty. His squiggles were something terrible when the important questions were asked.

And let us further suppose that the court-martial records show that suspect F was later picked up a couple of weeks after this with the identical case of beer, serial numbers intact, in his possession, and was tried and put in the brig.

If this happened, I would say, "Well, gentlemen, we have started on an interesting ex post facto inquiry."

And as far as we have gone, on just this No. 1 case, from Camp Gordon, Ga., it looks as if the polygraph was on target.

In the case I put, could we not tentatively say that as we went on to case No. 2?

Dr. ORNE. Not scientifically, sir.

Dr. LACEY. Could I help?

Mr. REUSS. Well, before you help——

Are you saying it would not be useful to undertake exactly what I am saying?

Dr. ORNE. Very useful.

Mr. REUSS. And it has not been done.

Dr. ORNE. Absolutely. I am agreeing with this completely.

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I am cautioning, however, that this really would not prove to me that the polygraph is good, bad, or indifferent, and if I may take an example from medicine, there is the problem of evaluating a drug. We know when a new drug comes out, if you give it to the GP, it is going to work for a certain period of time, and somebody has proposed that you should be sure and use a drug when it is still new enough to work, because after it has been used around a while, it sinks in potency to its actual level. In other words, its placebo effect is less.

And you would not consider today evaluating a drug without giving placebos to other people. But if it turned out that if the doctor knew which drug was active, and which was the placebo, it makes a big difference, because he was giving the active drug with conviction and the placebo without conviction.

And so you not only had to give a placebo, in other words, not only did the doctor have to try it that way, but you had to have somebody else code the pills, so that the doctor who was giving it would not know whether it had an active ingredient in it.

And then you find sometimes very dramatic results with the placebo. Occasionally you see side effects and even serious complications with the sugar pills—these are, of course, either suggestions or coincidences, but the drug is blamed and discontinued because the doctor does not know its placebo until later. A control group is needed to judge complications as well as therapeutic effects.

There is a tremendous amount of data to show this.

Mr. REUSS. Now, how does this apply to the hypothetical lie detector ex post facto visit that I was talking about?

Dr. ORNE. Because we have to separate the extent to which the polygraph operator produced a different polygraph record, by testing the subject in a different way, because he was convinced that the suspect was guilty.

So that it makes a big difference if I ask somebody: Was it No. 1, was it No. 2, was it [with emphasis] No. 3?

Mr. REUSS. You are saying in very clear and illustrative form what I commented on a while ago: namely, even if this test No. 1 that I have posited seemed to say that the polygraph did a masterly job in this case, maybe it did not, because maybe the polygraph operator had extrinsic evidence and was in the shoes of the doctor who gives the placebo.

However, if the Camp Gordon test disclosed that the polygraph operator said, after reading his charts, "Suspects A, B, C, D, and E are innocent, suspect F is guilty," and if the court-martial records later showed that a fellow named X, who was just walking down the road and had no relationship to A, B, C, D, E, and F, had actually stolen the beer and was convicted on indisputable evidence—if this were the result of that polygraph test, then you would certainly say that here the polygraph was not only of no value, but was misleading, would you not?

Dr. ORNE. No, sir. I would again want to know what the polygraph data was, as opposed to its contamination, because it can work for you, it can work against you.

But this is the whole problem: that under ordinary circumstances, the same argument, which I have said might well work for the polygraph, might actually be confusing the thing, whereas if you had it done blind, in other words, properly, properly controlled, and you

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had a neutral test across the board, you might well find subjects A, B, C, D, E, and F were innocent, by reasonably objective criteria.

Mr. REUSS. But the results of this would have established that the findings of the polygraph operator in this particular case had been erroneous and misleading, from the standpoint of the object of the exercise, which is the detection of crime. In the case I put they pointed to a man as guilty who was in fact, in my hypothesis, innocent.

Dr. ORNE. Sir, I think I understand the difficulty. You are trying to establish what is, with present-day technology.

Mr. REUSS. Exactly. The question I asked this morning: Is it now, in the current state of the art as practiced, a valid procedure?

And it seems to me that one of the best single ways of telling whether it is valid or not is a way that, so far as I know, nobody ever does—to look back over the records and see whether you cannot get some enlightenment there.

Dr. ORNE. I think what both Dr. Lacey and I were trying to answer is a somewhat more basic question; namely, not only is it a valid procedure today but what does the procedure intrinsically have in it in terms of how good is it really potentially?

Mr. REUSS. But I think it is important to distinguish this. It is one thing to have gentlemen like yourselves in your scientific experiments determine whether at some future time the world can evolve something which you might want to call a lie detector which would be of use in employment screening or in criminal detection or something else. It is quite another thing to blithely sit by while our Government undertakes 20,000 polygraph tests a year plus what the security agencies do, and private industry takes hundreds of thousands of such tests a year, without anybody knowing whether they are worth the paper they are written on.

Dr. Lacey, the subject matter on which you wanted to comment has not been covered. I invite you to comment now.

Dr. LACEY. The phrase is constantly being used, "Is the lie detector valid?" I think our whole discussion today and tomorrow will be clarified if we change that question.

This is not a question that the scientist would ask. I think we would ask the question, what is the degree of validity, and under what circumstances was his degree of validity obtained? This perhaps brings out my main quarrel, if we are still talking about retrospective studies, I don't believe there will turn out to be such a thing as a single degree of validity of the polygraph test. The validity, I would suspect, will change as a function of, for example, the subpopulation with which we are dealing.

I think it is very likely that we will get different results with the socioeconomically deprived resident of a large city slum or the embezzler. I believe embezzlers tend to have somewhat higher IQ's than petty thieves.

I think the validity will change as a function of the nature of the interrogation procedure which I am certain is not objectively in the files in the way we would like to evaluate it.

We would need tape recordings of every nuance, of every change of tone.

Mr. REUSS. If I may interrupt you at that point, we were informed by the armed services that tape recordings are frequently made, often-

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times unbeknownst to the person being examined. This gap in the body of evidence could therefore be supplied.

Dr. LACEY. And I am sure that going around the country to some of the agencies that are using it, this one would fill one gap more or less and that one another gap more or less.

I am also quite convinced, and I mentioned before this is a prejudice—I am prejudging the event on the basis of past experience—I am convinced in no place would we find the kind of data we need. We would do it much more reliably and we could answer your question, too, that is to say, we could set it up—we don't intend to but it could be set up so that lie detection as it is practiced today would go on. There would be either no interference or minimal interference with it. Then perhaps in a somewhat shorter time and in a more decisive way, we could give you some evidence of the range of validities to be expected for different kinds of crimes under different kinds of circumstances, and indicate what kinds of decisions may be made.

Is it true, sir, that the decision is always black and white?

I mean, guilty or innocent. Are those the terms in which they are placed usually?

Mr. REUSS. I wouldn't know until I had made the test and until I had seen what the polygraph operator says. He must have some end product. Some of the people who testified before us indicated that they could pinpoint this with uncanny accuracy, to use their adjective.

Dr. DEARMAN. May I say in the 200-page report that I gave you on this patient for your use, the polygraph operator's report was in there. He specifically stated, after lengthy questioning and so forth, this man did finally confess he was guilty. Not only that, but the polygraph operator who came to the University of Virginia, and she knew nothing about what was going on except she took the questions and she asked them. After asking them she said, "This man has been stealing money from the bank."

So they do say either innocent or guilty in the two cases of polygraph operators that I have known.

Mr. REUSS. One was the case of theft. What was the other case?

Dr. DEARMAN. They were the same case. This was the man who was asked the question, "Have you stolen any money from the bank or its customers?"

Then the vice president was sent to me. I worked this case up, made a hypothesis of what I thought would happen if you gave him another polygraph test, and that is exactly what happened.

Mr. REUSS. Let me get this straight, because I am not familiar with this case. The polygraph operator from the University of Virginia asked the question: "Did you steal the money from the bank?"

Dr. DEARMAN. Let me start back at the first. This man was given a routine polygraph examination in the bank. In fact, he was given three, then another one called the peak of tension test. Each time they asked him, "Have you stolen money from the bank or its customers?"

On any question in which the word "customer" was used, he got a positive response. So, he finally signed a confession.

Well, before he signed the confession, he said, "Tell me how much money I have stolen." The operator said, "You will have to tell me.

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You will have to give me some figure to start with," because some of the things he had said about 50 cents for parking and $5.50 for taking a trip that he didn't take for the bank, that he kept. He finally added up and he said, in his mind, and said it was $300. So they started with $300. When they got to $1,100, he got a positive response. He said "No" and the machine said "Yes." He went as high as $3,000 with no other response. Then the polygraph operator tore the paper off the machine, walked over to the vice president and said: "I just wonder when you sat down in the chair did you have any other figure in mind?"

The man said, "Yes, I did; $800."

The polygraph operator put these two together, wrote out a confession for $1,000 and the man signed it.

Mr. REUSS. Did he steal the $1,000?

Dr. DEARMAN. No, sir, he didn't steal anything.

Mr. REUSS. Who did?

Dr. DEARMAN. Nobody did. No money was stolen.

Mr. REUSS. This is the only case I know of where the results of a polygraph test have been subjected to ex post facto analysis and from your testimony it would appear that the polygraph operator, who I gather was a reputable one——

Dr. DEARMAN. Yes, sir; recommended by the bonding company for the bank.

Mr. REUSS (continuing). Found a guilty response to the key question as to whether the suspect had stolen money from the bank?

Dr. DEARMAN. Yes, sir.

Mr. REUSS. And it turns out that this was an incorrect judgment on the part of the polygraph operator. While the line may have wiggled, if it did wiggle, it wiggled for other——

Dr. DEARMAN. Yes, it wiggled the next time on other questions.

Mr. REUSS. I would say this is the kind of study we need to make as the retrospective part of the total study. We would now start out with the lie detector batting zero as a result of test No. 1.

Then there are several thousand more cases that would have to be looked into. When we do that, with competent people making the study, we would then have some idea of the efficacy of lie detection as presently practiced.

Dr. LACEY. Mr. Chairman, this very case demonstrates the reliability of the polygraph.

Mr. REUSS. Of course, the polygraph accurately records blood pressure, galvanic——

Dr. LACEY. Two separate examiners separately said there is an area here which exhibits disturbance. This, I think, we can all do with much greater than chance. Then comes the inference, what does the disturbance mean? That is why I asked the question: Do they say guilty or innocent?

I think we would all agree that one should not say guilty or innocent.

Mr. REUSS. Here, however, the operator did and thus I think we can——

Dr. LACEY. But if the operators had only said there is evidence of real disturbance, here both would have been in agreement, we would have had a very good case.

Mr. REUSS. You don't need an operator to say that, do you?

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Can't any one make a visual observation that the wiggles after a particular question are wider than the wiggles after other questions?

Dr. LACEY. Yes, when taught what to look for, some would be more apparent than others.

Mr. REUSS. So I would think that this one test that Dr. Dearman describes, so far as it went, was what needs to be done on a very wide scale.

So far as you know, this is the only case?

Dr. DEARMAN. This is the only case ever reported in the world.

Mr. REUSS. The only time anybody has ever taken any trouble to go back and take an independent look as to whether the readers of the polygraph have had much luck or not.

Dr. LACEY. As long as we stick only to the lie detector test, you are cutting off from consideration a great deal of other information that we have. For example, your very strong distinction between the laboratory situation and "the real life" situation may not be quite as dichotomous as it seems. This too is real life.

Mr. REUSS. I have one other question of the panel. What about the use of drugs, particularly more modern drugs, by guilty people in order to depress their reaction to questions put to them by a lie detector operator? Are there such drugs and could their use render the lie detector less effective than it otherwise is? Does anyone have any knowledge?

Dr. LACEY. A parasympatholytic agent could destroy cardiac responses during the conduct of the polygraph examination. This would be immediately detectable upon recording heart rate and blood pressure. One would know that either this individual's cardiovascular system has been rather atypical or he has been under a drug.

Are there any drugs being used specifically as adjuncts?

Dr. ORNE. I believe the question is addressed to the issue of could you give a drug which you wouldn't detect?

I presume you are thinking of tranquilizers of various kinds, barbiturates, this kind of drug. I don't know what the answer is. We just casually looked at it a bit. There is a tremendous amount of work which would have to be done to give a real answer. But you have two problems essentially. You have a signal and you have got background noise.

Now, if you take a drug which will quiet you down, as it were, you are going to diminish not only the signal which you are looking for but also the background noise.

There are some circumstances with an anxious subject, in an experimental situation admittedly, but with an anxious subject where he becomes much easier to recognize in case he takes a calming drug because you not only have diminished the signal itself but you have much more diminished the noise. There is no drug that we know of, at least that I am familiar with, which would eliminate the signal, in other words, which would act so differentially on the emotional response without eliminating extraneous emotion to an equal or sometimes greater extent. This would be a guess at the present state of knowledge.

Now, the drugs which eliminate sweating, for example, these would not help you because they would be recognized. You would know somebody was taking a drug.

Mr. REUSS. Mr. Kass.

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Mr. KASS. Dr. Dearman, you stated earlier that no money was stolen from the bank.

Dr. DEARMAN. No. I would like to add one thing. When the examiner asked the man if there was any other amount he had thought of, the man said $800. The examiner then said: "Well, you got a reaction at $800." So he got a reaction at $800 and $1,100.

Mr. KASS. You stated no money had been stolen.

Dr. DEARMAN. No money had been stolen.

Mr. KASS. Are you satisfied that no money had been stolen?

Dr. DEARMAN. I had a 2-hour interview with the president of the bank the third night after I saw the patient the first time. He said, as far as he was concerned, he was fully satisfied no money had been stolen.

I said: Is there a possibility even that money could have been stolen? He said, it would have taken a $10,000 audit to find that out. He said, "With our audit and the place where he could have stolen the money, all the books check, no money has been missing in that account for 5 years."

Mr. KASS. So the bank president, himself, was satisfied that no money had been stolen?

Dr. DEARMAN. That is right; and the man went back to the bank.

Mr. KASS. You stated there were two polygraph examiners. You only told us about one. Can you go into the second polygraph examiner situation also?

Dr. DEARMAN. Yes. After I had gone over this case for several hours, including a sodium amytal interview, at the end of my study, I then hypothesized if I was right, if the $800 and the $1,100 had meaning in connection with mother and wife, which I found out that they did have, then if you ask the man the same nine questions, he had been asked before, he would get the same reaction that he did the first time. Then if you break these questions down so that you leave the word "customer" out, give the question the same meaning, every time "customer" was in the question, regardless of the man's answers, he would get a positive response. And every time that you left the word "customer" out he would get a negative response in regard to stealing. This is exactly what happened.

Mr. KASS. Did the examiner have an opportunity to conduct what she thought was a complete polygraph examination or did you just give her a list of questions?

Dr. DEARMAN. I gave her the list of questions. I said: I want you to conduct this as you would conduct any polygraphic examination.

We watched the procedure through a one-way mirror—Dr. Smith and I did. We did not listen. We didn't have anything fixed up for tape recording. She, I suppose, conducted it as she usually conducts an examination.

Mr. KASS. With all the questions that this polygraph female operator or examiner would normally ask?

Dr. DEARMAN. Yes; in fact, there were some questions I did not have down and she asked permission to ask two control questions, to see how high a response she would get. For instance: "Did you have any intention of lying to me when you sat down to take the test?" She said this will always give you a positive response. This is testing the maximum lie—we would test the minimum on what we would call questions that had no meaning.

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Mr. KASS. Did this polygraph examiner at any time during the experiment or after, to this date, ever complain to you that she had not been given an opportunity to conduct a proper examination?

Dr. DEARMAN. No, sir. Would you like me to read the letter from her that she has written?

Mr. KASS. Please do, Dr. Dearman, but just the pertinent parts.

Mr. Chairman, could we insert the letter in the record?

Mr. REUSS. Without objection, it is so ordered. (See exhibit 20, p. 402.)

Dr. DEARMAN. You have the entire letter in the report I gave you; in the 200 pages. This letter is dated April 1, 1962, as follows:

I would like an opportunity to come to Charlottesville and speak to the doctors in the Department of Psychiatry to enlighten them on what the polygraph does accomplish so they may know how it may be used in any future research regarding human personality. The best of luck to you on the publication of your article. I shall be looking forward to receiving a copy of it. Let me say again what a pleasure it was working with you on this. It marks one of the highlights of my polygraphic work this year.

Mr. KASS. This was signed by the polygraph examiner who examined the second case?

Dr. DEARMAN. Yes.

Mr. KASS. Thank you, Dr. Dearman.

Dr. Lacey, you stated earlier that in the critical areas of our Government—and I assume you meant agencies like the National Security Agency, Central Intelligence Agency—it is possible to use a lie detector under—and I think you used the words "with all sorts of precautions." Could you define what type of precautions are necessary? In fact, I think the panel could answer this.

Dr. LACEY. Well, I have to be an idealist, again, in answering that question. Now, we change from the scientific aspects of the participation of physiological response in behavior to the protection of the rights of individuals and here I feel very strongly. I must admit that if a tenth of what I have been reading in the newspapers is true, I am horrified at the casualness with which this is handled.

Let me start out by saying this: Even a test with relatively low validity can be shown and, I think all of us who have worked in this area will agree, as a mathematical consequence can be shown to improve the probability of making a correct choice. For example, taking an entirely unrelated subject, in World War II, we had to produce a great many pilots, bombardiers, and navigators, and we had to produce them in a hurry. We were up against it. A massive program was mounted, the aviation psychology program, for the selection and classification of aviation cadets.

In the course of a few years, with a sort of a small-scale Manhattan project, a considerable variety of tests and procedures were devised which had validity against a given criterion; the first step in the process of producing pilots, bombardiers, navigators, namely graduation from preliminary training. These tests, taken singly, put together in proper multiple repression form, had a validity which I would be surprised to find exceeded by a polygraph examination. The validity was such, however, that there was a great deal of misclassification of the individual. There were many false positives and many false negatives. Nevertheless, given a very large population, a very large labor supply, if you will, and given a very high cutoff

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point, we could demonstrate retrospectively and prospectively that at one stage of the war when we had a very large supply and very small number we needed to select we could guarantee about 90 percent graduation from the class if my memory is correct. It was very, very satisfactory.

Now, then, the rights of many individuals were violated. That is to say, there were many false negatives, there were many people we denied the opportunity to engage in training for pilot, bombardier, and navigators. They might have made good pilots, bombardiers, and navigators; better than the ones we chose. We goofed many times with false positives.

Unfortunately, too many of the young lads we admitted to the program spun in and killed themselves and killed their comrades on training missions, and so on.

Retrospectively, some of these were not accidents in the sense they could not have been predicted. Many of these individuals were accident prone. So we violated human rights and we endangered human life in the course of it.

Looking back on it, I think it was justifiable.

Now I will completely agree with Dr. Kubis in what he characterized as trivial instances, like preemployment screening. I am horrified at the thought of a department store clerk being subjected to a polygraph examination. I am not horrified at the thought of men being selected for some highly sensitive mission in our Government, let us say, and the polygraph being used as one—and not even a major one—information-gathering device. I would like to see that expanded. I would like to see a great deal of research done on it.

Now, then, however, those using it, I think, have to be very, very much aware of the fact that in this case that they are going to have a lot of false positive records. They are going to label people, for example, as actual or potential homosexuals. They are going to label people as having engaged in shady practices, and so on.

They must be aware of the fact that they may be wrong. They may be wrong perhaps in a large percentage of those cases. They should say something to this effect: "Gentlemen, we have to select 10 people for such-and-such a job. We have 1,250 people from whom to select these 10 people. We are going to subject you all to these procedures, one of which is the polygraph, and on the basis of them we are going to select 10, knowing full well that the adverse decision against you is made only because we are playing the probabilities; we are playing an actuarial game; we are playing an insurance game.

"Under no circumstances will the fact that an adverse decision has been rendered, under no circumstances will this be made part of your dossier."

I wish we could do some brainwashing and all the people who did the examining and made the decision will never remember that good old Joe, the one we thought was good old Joe, was turned down in a job examination. That is the idealistic part of it.

Somehow everybody utilizing these techniques must be made aware, it seems to me, that they are placing the reputation of people in very serious jeopardy with a tool of imperfect validity.

So, ways have to be found to protect legal rights. First of all, the polygraph operator should never make the legal or administrative decision. That is true whether he is a private with 2 years of high

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school or whether he is a Ph. D. and an M.D. I, myself, would never make such a decision. But I would be very glad to provide evidence saying there is some area of disturbance here to a trained, qualified person who has the responsibility for making that kind of legal and administrative judgment.

Dr. DEARMAN. May I ask you something?

Dr. LACEY. Surely.

Dr. DEARMAN. In other words, this thing is so highly sensitive we are talking about, in which our country is at stake, you might say, then the one giving the polygraph should be a highly trained individual, should he not?

Dr. LACEY. That is a loaded question. Yes; I would agree. He should be absolutely qualified to do the job but I can't answer your next question: What are the qualifications?

Dr. DEARMAN. I should say the ones most capable of doing that are men like you who have done your research, have degrees in psychology and psychiatry, men who know something about human personality. In other words, to me the lie detector is nothing but a projective test which projects the physical components of an emotion, much like the Rorschach is a projective test of the psychic component.

Dr. LACEY. I would think of it in another way. With the current level of our instrumentation—let me interrupt myself to say that I am not talking about the commercial polygraph now, I am talking about the kind of instruments we use in the laboratory. Maybe the commercial polygraph is fine—I say again I don't know these instruments. I do know, however, they are not utilizing the newer techniques. I would say that with the kind of instrumentation we have today, with the kind of know-how we have today in terms of autonomic measurement to secure, for example, a mathematical evaluation of the responses, and a portrayal of a profile of reactions, I would say that in a reasonably short period of time—don't press me to say how long—but in a reasonably short period of time, I could train a technician to produce a record, just as we have trained technicians to produce X-rays, to produce a glucose tolerance test, and so on. But they don't make the clinical decisions.

Dr. DEARMAN. That is right. You would make that.

Dr. LACEY. Yes. But I would not like to make the legal administrative decision. I would be able to make the clinical diagnosis that something is going on here.

Dr. DEARMAN. In your opinion, this is what you believe. Then you would say to the administrator: "What you want to do with this information is your business." That is what you would be telling the administrative officers.

Dr. LACEY. My own feeling is that this would have to be spelled out legally, administratively with some real protection.

Mr. KASS. Dr. Lacey, from your knowledge, not as a layman but a man experienced in the use of the component parts of the polygraph for the last 20 or 25 years, what would you recommend as the minimum training requirements? What are the minimum standards which should be in existence today, not projecting 2 or 3 or 5 years, but today.

Dr. LACEY. Not knowing in any real detail the problems that the polygraph operator on the line is facing, I really can't answer that question in that way, but I can answer it this way: I have to train in

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the course of my work a variety of technicians. I have technicians carrying on the experiments as well as professional people in the laboratory.

How long do I take to train a technician, let us say, in the operation of an experiment which requires some four channels of information, which is about as much as I can handle. I have the capability for 19, but I rarely take more than 6. I will take a nurse, an X-ray technician, a college graduate, and in some 6 months I will be comfortable in leaving that person alone to take the record. That is to say, I will be confident—perhaps mistakenly so—I will be confident that this technician now knows how to turn the right knobs in the right sequence, can identify an artifact such as a popping electrode, a GSR artifact on the skull, if we are taking brain wave, too tight a cuff, too much venous occlusion if we are measuring blood flow. In 6 months, I will be confident in leaving this person alone to take the record.

I would not be confident—well, the Ph. D's who have come to me for postdoctoral training—I am not comfortable leaving them alone for the complete design of an experiment and for the complete interpretation of a set of data and what they mean, in 3 years. So, I think technicians can be trained fairly quickly, and the more delimited their task and the more objective their instrumentation, as Dr. Orne has correctly pointed out, the easier it is to train.

Mr. KASS. Leaving aside for the moment the question of interrogation as it relates to the polygraph as a lie detector, it would be your conclusion that a 6-month training program would be the absolute minimum to learn how to use the various component parts, the knobs, et cetera?

Dr. LACEY. To learn enough about the underlying physiology, which is absolutely required—to learn enough to identify artifacts, let us say, I would be comfortable with the 6-month criterion. Some people will learn it in less than 6 months. I would be comfortable with a 6-month criterion to be followed by a long period of internship, of supervised experience.

Mr. KASS. At what point would you be satisfied that the person can devise the experiment or to put it in the polygraph detection term, to create the question formulation process? How long a period would that take?

Dr. LACEY. I went to ask my prospective father-in-law how long it would take before I could marry his daughter. He started out by saying, "John, I would be doing both you and my daughter a disservice."

I think I will answer that question by saying, Mr. Kass, I will be doing both you and the polygraph operators a disservice by even attempting to answer that question. I don't know the operational characteristics on the line. I would just be giving you a guess. The longer the better.

Mr. KASS. Dr. Kubis, you do know the characteristics of the lie detector. Would you comment on the minimum qualifications and standards that are desirable?

Dr. KUBIS. This raises two problems that Dr. Lacey has mentioned: Technicians versus operators. We have to decide which ones.

Mr. KASS. We are talking about the present state of the art today not as projected in the future. Today, apparently, the individual ex-

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aminer and operator in the Federal Government and in the commercial practice is both a technician——

Dr. KUBIS. That is right. Consequently, this is the more serious question. It is fairly clear that a technician can be trained as Dr. Lacey mentioned, fairly comfortably within a period of 6 months. Some earlier, depending on the capability of the individual.

Mr. Moss. At that point, what background, minimum background should we have for this proposed trainee?

Dr. KUBIS. Dr. Lacey, and I agreed with him, has mentioned that there is no specific background that is necessary for a technician. It is like the man who can inject a syringe when necessary in a submarine. But he is only a technician. He is not going to evaluate the records, a procedure which is the critical issue in the lie detection test nor make the final diagnosis. Even with the technician, we have anywhere from at least 6 weeks to 6 months. This has nothing to do with the structuring of the questions, and with evaluating the situation and being able to pull out the essential details that will maximize this response which people call the lie response. This is a very difficult procedure. You may have a robbery but if you ask the wrong questions you are never going to get anywhere. You have to know the individual, his capability for understanding your language. You have to be able to formulate your own ideas into the language that is the other person's language so that communication can take place in a two-way fashion. This is an extremely difficult job. So much so that in some sex cases—I have heard these stories and I believe them—very naive operators trying to indicate how learned they were used words with children like "penis," which the child didn't understand at all, then of course he didn't insert a penis into the vagina of a little girl if she didn't know what a penis or a vagina was.

This requires an ability of the individual to do a critical amount of translation to the level of the man he is examining. Therefore, he has to know the person very well.

This means that at the operator level, we have to have a man who understands people, who knows a lot about motivation, who has a facility for translating his own, say, abstract notions into concrete terms so that this two-way communication can come about.

Now, this is just the first stage. Then comes the application of the test.

As Dr. Orne mentioned, we can by changing the inflection of the voice incriminate the individual by asking the question. This is a common procedure in law when the lawyers object to the way a question has been asked of a witness; namely, the question may be asked so that the witness feels he is being accused rather than being asked.

We should require a great deal of training in this type of procedure. Some people have suggested that possibly you might record the voice as a monotone and have that same voice ask questions of all the individuals who are being examined in a particular case.

This brings up another difficulty, because, it seems that a live person asking the question is probably more efficacious in arousing what may be called the "lie response" than a canned voice which is recognized as being canned. So these bring about a number of problems where the operator has to be trained to be as objective as he can. This is a very difficult procedure, especially when he is given the facts

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of the case. Those facts are colored by the persons who are giving the facts. He may prejudge the case before he begins for he may select questions in accord with his prejudices.

Now, how do we train a man to be objective in this? This is a second difficulty.

The third is interpreting the responses.

So we have at least three sets of difficulties that come about. In this particular case, the ability, the capability of a man to become a good operator, and that does not mean an interrogator. An interrogator is one who has an ax to grind sometimes. That is an interpretation that may be given to the word "interrogator." But let us say we have an examiner, an understanding examiner. His competency is in part a function of the individual and in part of training. How much training we should give to an individual in order to be an understanding examiner, is a difficult point to establish, but obviously it is going to be more than the 6 months to train a technician.

We all know that some people can never be good therapists. Others can be trained to a certain degree.

Now, we have a similar situation in detection training. It is extremely demanding because the person has to be very objective. He cannot be prejudging the issues before the answers come. Yet, it is almost an inherent tendency in a human individual when he is given a set of facts about a case and the people who are involved—it is almost humanly impossible not to form some tentative estimate of who the most guilty person is, if you know all these facts in the case.

Suppose we withheld these facts from the examiner. Shall we then have a second man who will just construct the questions for the case? This brings up another matter about the nature of the examining process in lie detection. At any rate, we can see at least a year's training period or more.

To become a good operator, one would need a good deal of training initially in sheer operating technique, a good deal of training in personality dynamics. One needs to eliminate the sharp edges that one has which may irritate other individuals and cause reactions in the person being examined.

I have a feeling this should be a long-drawn-out procedure; but there are other people, equally competent, who probably feel it can be done in a much shorter period of time. To me it is an extremely serious problem when the reputation of an individual is at stake—even his life. You can kill an individual and he is done with. But once you attach an incriminating label to him that goes along with him for the rest of his life. This is killing him in extremely slow stages psychologically.

Dr. DEARMAN. Might I add here also that the examiner must know a lot about his own blind spots. You might say, if his personality, for instance, was such that he felt guilty about masturbation and one of the men he was examining said he had been masturbating this might arouse anger in the examiner and therefore cause him to bear down on this fellow more.

Dr. ORNE I don't know; I have a real problem in answering this. You might say obviously the polygraph operator, given his present task, should be someone who has at least psychiatric training—has been analyzed. In addition, he should be a psychophysiologist.

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Furthermore, he should have at least 5 years' experience as an interrogator. I don't know of anyone who matches these criteria. This may sound facetious. In a sense, it is, but in a real sense it is also serious, because we can set a certain ideal. We need to approximate this idea. The closest one can get, and here again are pragmatic and administrative questions; namely, I would not like to say, for example, the person should be, let us say, a psychiatrist, because I don't know where you are going to find the psychiatrists who are going to give polygraph examinations. I don't think you would choose to do this as your life's work. I know I wouldn't. I don't know of any psychiatrist who would.

The same holds for psychologists.

Mr. Moss. Doctor, are we then saying that this device is so important that the end does justify the means and we will take the best available?

Dr. ORNE. No, sir; this is not what I would like to say. What I would like to say is that we should have an idea of how close we come to this.

For example, take the issue of therapists. We know what we would like to find in a therapist. We also know in a State hospital situation, volunteer college students have done a tremendous amount of good in getting people out of hospitals.

Since we can't get enough therapists to work in State hospitals, we encourage the college students to come in. It does get patients out.

We psychiatrists often have a red face—well, they get people out.

Mr. Moss. The good outweighs the damage that might be done.

Dr. ORNE. Under those circumstances.

Mr. Moss. Under those circumstances.

Dr. ORNE. Now, I think here we would have to say, we would have to begin with individuals with reasonable maturity, reasonable intelligence, and select people who are willing to do the job because there is no point in setting standards where you aren't going to find anyone. Then given that, I would then go along with the kind of training which both Dr. Lacey and Dr. Kubis outlined.

I think it is an empirical question of how much you need. I think you could find out, once you did studies to find out who is good, the problem is we don't know yet to what extent training makes a difference. They think it makes a big difference. As a guess, I would say it probably does.

I would like to have an empirical comparison of people who were trained for 3 months versus those trained for a year versus those with 5 years' experience.

Only when you see that data would I be in a position to make any kind of judgment. We may be surprised. I think it should be looked at as a question which should be explored.

Mr. Moss. Dr. Kubis, I came in the middle of your discussion. You were indicating a 6-month training period for the technician.

As I review the responses to the questionnaire prepared by this subcommittee and sent to the Federal agencies, we find that their examiners or operators or technicians—and this seems to be a term that is not precisely defined—I had a very interesting discussion with Mr. Baxter over the correct terminology and we went around the barn and got nowhere. But whatever we call them, the Government uses

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one person to give this examination. Now, is he the technician trained in your 6-month period or is he doing a job far advanced of this 6-month trainee?

Dr. KUBIS. Do we have any information what school they came from or how much training they have had? I don't know.

Mr. MOSS. Let us take, over in the Army military police, they have a training program down at Fort Gordon, Ga., and it is 7 weeks. They required that the operator be a U.S. citizen, that he have 2 years of college, that he be 25 years of age, that he hold the rank of warrant officer, that he have no court convictions, be an accredited investigator, with 1-year experience, and have passed a criminal investigation course. Now, I haven't inquired as to whether that course is as extensive as this 7-week course for the polygraph operator, but I would hope it would be more extensive.

Now, that is the requirement for the military police.

We get down here to Naval intelligence in the Department of the Navy. We find that he must be a GS–9 or its equivalent. He must have a college degree, be 25 years of age. He must complete an internal course of 5 to 8 days, and have a history of meaningful interrogation experience, however that might be judged. The criteria are not set forth here.

Then we have the Post Office Department where they gave 338 tests. They have 17 polygraphs and they have a requirement that the person be 30 years of age, a high school graduate, postal field service grade 13 or above, and have 5 to 8 years of investigative experience and he is given a special course. It is the 7-week course at Fort Gordon.

These are some of the typical qualifications of the polygraph operators now doing the job for the Government.

Dr. KUBIS. I am a bit extreme on this issue because I believe that examinations of this sort should be done only in serious matters. If it is a serious matter, this involves consequences that may be very grave to the individual and I would expect much higher standards. Now, if they examine an individual, as has been mentioned before by Mr. Reuss, for stealing, say, a package of cigarettes, I feel, unless there are other reasons to the contrary that these are not serious enough matters for which lie detectors should be used. It is a tremendous waste of valuable time unless there is an important principle involved where you may want to deter more serious behavior and not have such things happen very frequently.

But to use lie detectors for very minor thefts just because, say, the bank has examiners on a yearly retainer fee and has them examining for small losses of about $10 or $15, I think this is a derogation of the possible scientific value that a lie detector may have.

It is these types of procedures that often attempt to predict what the man will do in the future. About 15 years ago somebody from an insurance company had asked me whether I could do this. They would be willing to pay high fees. I turned them down flatly. I told them very realistically that one can never predict what a man will do in the future, say, in terms of whether he will steal or not. This is an impossible matter as far as I am concerned. Anybody who attempts to do so puts himself in a very unfavorable position.

However, I am sure that that organization did get somebody to work with them on this type of procedure. The present-day excuse

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for such usage is that it will prevent people from stealing. This is a different issue. There may be better ways of preventing people from stealing. You may not need to have a lie detector around to use as a preventive measure.

It is uses such as these that I object to very strenuously. The instrument is not being used in a scientific manner but is used as a bugaboo. These types of procedures degrade any scientific application.

As a comment on the qualifications, they may have in terms of years of investigative experience some of the things I would like in an investigator, although there is no guarantee from the numbers that are given in here, 1 to 2 years, or 5 to 8 years, whether those are real training and sound investigative experiences.

Mr. Moss. You are undoubtedly aware of some of the types of articles which have been printed extolling the virtues of this machine for personnel screening, aren't you?

Dr. KUBIS. Yes.

Mr. Moss. One of them was submitted by one of the witnesses in the earlier hearings. I will ask you to look at that.

Dr. KUBIS. I am not in favor of such screening procedures where there are no basic issues involved, such as whether a man has done something which is serious and which is a violation of law. These procedures are often searches into the past of the individual which may damage the individual. They not only upset him but damage him because they elicit information from him that can be used against him. We have no way of guaranteeing that such information will not be put into the hands of unscrupulous individuals. We do not know whether the secretaries have access to such files and will spread information of this sort around. To get such information about the personal lives of individuals when nothing serious is at stake, I think is a danger that creates all of the unhealthy aura that surrounds lie detection procedures.

Mr. Moss. Dr. Lacey, this morning, as I recall, you were reluctant to stipulate that there would be justification but you stated that there might be justification in certain areas in our Nation's life where the polygraphs can be used. I think you inferred that these areas would be those bearing strongly upon the security of the Nation.

Now, if there are those areas, and I think it might be well here to briefly summarize the assignment this committee has been given. Congressional committees do not start out on fishing expeditions. For instance, this committee has spent more than a year in very careful preparation for the hearings previously held, the hearings today, and other series which we will hold before we finally conclude the work of this committee. Our assignment was to make an evaluation, an overall evaluation, of polygraphs as they are used in Government.

Now, explicit in that instruction to the subcommittee is the requirement that we make findings and conclusions and recommendations that we will file formally in a report to the Congress.

Now, in carrying on this type of study, we expend a fair amount of tax dollars, so it is expected that we will come up with recommendations that are properly documented. Of concern to the subcommittee is the use of the polygraph by agencies deeply involved in the security of this Nation.

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Now, if there are valid reasons why the polygraph be routinely used in personnel screening, in periodic reexamination of personnel before new assignments, and before promotions, then we would first agree that the Nation's security is involved and, therefore, it is a most important area.

Would you require in this field more carefully trained, more highly qualified personnel operating these devices?

Dr. LACEY. I think before you returned, Mr. Moss, a similar question was asked and I gave my feelings about it then. But I can state them again, if you wish.

I think the essence of my answer was yes, I think the polygraph should continue to be researched in these agencies but that they should be covered by the most intensive legal and administrative supervision that can be mustered.

Again before you returned, we were building up the concept that a technician can take a polygraph record, but it takes a great deal of training and caution to say anything more, to interpret it. I think I said that for my part the only thing I would ever be willing to interpret in a polygraph record is that there is some evidence that this set of stimuli has some special differential significance for this individual. It does not mean guilt or innocence, does not mean that he is a homosexual or has latent homosexual tendencies. It means there is some differential significance. What it is remains to be determined.

This may get to be a complicated medical, psychological, legal, and administrative decision.

I also stated that when it is deemed necessary to use this technique, which under favorable circumstances will have better than chance validity, when it is deemed necessary—and I am not prepared to spell out, you know, what the basis for "necessity" is—when it is deemed necessary to use it, one should go all out to protect the rights of the individual concerned.

I gave a hypothetical case of a thousand agents being available as a pool from which 10 agents have to be selected for some specific job which requires some specific something or other. I feel that it should be made very clear to everybody concerned, that everybody concerned from the technician up to the final person who makes the decision, everybody concerned understands there will be false positives, that many of the 990 who are not allowed to go to this job are not therefore necessarily guilty of anything or possessed of any bad attribute or attributes; that we were playing an actuarial game here for the good of our country; that, therefore, this record should never be part of the individual's dossier; it should be expunged from the record entirely; it should never follow the individual beyond that point.

The only reason it was used is because we want to increase the probability of selecting the proper 10 people for the job. It is only increasing the probability. That is the sort of thing I had in mind.

Mr. MOSS. Is there disagreement?

Dr. DEARMAN. No, sir.

Mr. MOSS. In other words, this is the consensus of the members of this group?

Dr. ORNE. Yes, sir.

Dr. KUBIS. Yes, sir.

Mr. MOSS. Mr. Kass?

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Mr. KASS. Dr. Orne, you stated earlier that you have no question in your mind, and I think the panel is in agreement, that the polygraph works—in your words—better than chance in a laboratory. Now, what about in a field situation? Are there many variables that must be taken into consideration? What are these variables? I realize they are probably numerous.

Dr. ORNE. They are many. I think a great many of them have been brought out. The kind of person it is, the kind of interaction that is going on. The amount of data which the examiner has beforehand. His biases and beliefs and how he communicates these. The individual's physical and mental well-being, and so on.

Mr. KASS. In a military situation, the rank of an individual, for example?

Dr. ORNE. Yes, the rank of an individual and the rank of the fellow who is testing him, obviously. It is always the interaction.

You are getting a physiologic response which is the result of very complex stimuli of which the questions are only a part.

However, hopefully, you are getting differential responses to questions. Since you have neutral ones, you should be able to form some judgment about this.

Now, I do not know, because the work has not yet been done, the accuracy of field situations. I would guess, based on laboratory studies, where it is very much more significant than chance, this holds true in the field also. This needs to be tested, needs to be evaluated. But, as an article of belief, I would say I am quite sure it will turn out to be significantly better than chance.

Given this fact, if this turns out to be a fact, then Dr. Lacey's point which he made, and which I tried to make also, which I think all of us agree upon, all you need is an instrument which is significantly better than chance.

If you have a large enough sample, it will be an asset to you to use it. Sure, it would be nice if you had 100-percent accuracy, then you would no longer need an actuarial kind of prediction. We have no such instruments at all in any part of science. If you have an instrument which is 80 percent effective in terms of any kind of discrimination, this is fine, and then depending upon where you place your cutoff points it can make this decision which Dr. Lacey was talking about earlier, selecting 10 people out of 1,000, very effectively. However, you will have lots of wrong positives which you will toss out. You have to be certain to protect these individuals. This is why I would completely agree with Dr. Lacey's point. As long as you know that you are going to have false positives, as long as this is clear but it is part of the game as it were, because the stakes are high and we can't make errors, then I would say if it is better than chance we have to use it.

Mr. KASS. Dr. Orne, on another matter, you worked and have done some studies on hypnosis?

Dr. ORNE. Yes.

Mr. KASS. Can you perhaps tell us how hypnosis would affect the lie detection? Is it possible to beat the machine or the operator, whichever the case is, through hypnosis?

Dr. ORNE. The answer to that is by no means clear. You can, under certain circumstances, give a very flat record under hypnosis. I don't

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know whether you would call this beating the machine. All you can say then is that you can make no decision whatsoever about the individual; he is nonresponsive. He not only does not talk, his physiology does not talk. Whatever that means, then, is an inference beyond that point.

Mr. Moss. Isn't the machine as reliable at that point as it is at any other time? The machine itself?

Dr. ORNE. The machine is telling you that the man's physiology is not responsive at this time because of some intervention.

Mr. Moss. If anybody is fooled, it would be the operator and not the machine?

Dr. ORNE. Right. The read-out is the read-out. Unless there is something wrong with the tubes or transistors, it is there.

Mr. Moss. Talking about the tubes or transistors, this is an electronic device using such components. What effect does it have if you have a weak tube or a somewhat faulty transistor?

Dr. ORNE. This should not present a real problem because there is no reason that this transistor should selectively go on the blink every third question which happens to be the important one. This should be random noise.

First of all, you should be able to pick it out.

Secondly, it would not selectively affect things since in each case you are comparing the individual response with his own response to other things. It is either a uniform artifact or random. If it is uniform, it does not matter. If it is random, it should wash out.

Mr. Moss. Providing the response is sufficient to be visually discernible on the graph. Now, could there be a lessening of the response on the graph if your machine has, say, a weak tube?

Dr. ORNE. Certainly.

Dr. LACEY. One should run calibrations before in the lab.

Dr. KUBIS. You put in a standard stimulus and expect a certain type of response. If one does not occur, you have trouble.

There are two problems in our discussion about the value that we are to place on the lie detector's judgment. Is this in a sense final? Does this have much weight in a final decisions, or is this advisory, that is, merely ancillary evidence?

We talk about lie detection and often consider it as giving a final type of decisions. We have quite a different orientation if it is just going to be some partial evidence to be added to the body of evidence that we have. We have to distinguish these types of uses for the lie detector. There are very few instances where the lie detector can be used as the sole source of evidence.

The only one that I know of is if two people get into an altercation where there is no observer and then one calls the other a liar. This is about the only situation I know where the lie detector operator is the only one that can make a decision since there are only two witnesses and each one is accusing the other.

The other point is that we have to discriminate very carefully between man-machine decisions and pure measurements taken from the machine itself.

These are two different problems. In one case in talking about the value of the lie detector we actually mean the lie detector as applied and interpreted by an operator. In other instances, we may be talking

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about the value of the lie detector when we refer only to machine itself. Then we talk about its reliability and whether it is a true reflection of the physiological state of the individual.

To what do we attribute the accuracy, to the machine or to the man-machine system that is involved here. This distinction will help us with the basic issues that we have to talk about and which, I am sure, the committee is interested in.

Mr. KASS. Dr. Orne, getting back to hypnotism for a minute. Is it possible that under a posthypnotic suggestion, a person would be told to suppress emotion at the point of mention of a word, for example, "communism"? Is this possible?

Dr. ORNE. It is possible to tell him this and the result probably, because we have only casual data on this, by so doing you would guarantee a bigger response because this would become much more conflict ridden and you would be picking up the conflict. Not only this but at times—and on this we do have some data—it is possible to pick up responses to stimuli which you do not have a conscious awareness of, which is very much Dr. Dearman's point, we can demonstrate this in a laboratory situation by giving you data in hypnosis for which you have amnesia, you do not have a conscious awareness.

This information we can elicit on the polygraph without the individual being able to identify why he is responding.

So, at least, as it looks today, if you are asking the question would hypnosis be an effective countermeasure, the data is very unconvincing, it probably would not be. You would probably make sure you got bigger and better wiggles.

Mr. KASS. I have no further questions.

Mr. Moss. Gentlemen, I want to thank you. It has been a rather lengthy day for you. I regret that other commitments made it necessary for me to be absent for part of this afternoon's hearings.

Dr. Orne, I want to particularly thank you. I understand that you have to return home this evening.

The committee will now stand in adjournment until 10 o'clock tomorrow morning, at which time we will reconvene in room 1501–B, in the Longworth Building.

The committee is now adjourned.

(Whereupon, at 4:30 p.m., the subcommittee adjourned, to reconvene at 10:00 a.m., Thursday, April 30, 1965.)

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USE OF POLYGRAPHS AS "LIE DETECTORS" IN THE FEDERAL GOVERNMENT

(Part 3—Panel Discussion With Scientists)

THURSDAY, APRIL 30, 1964

HOUSE OF REPRESENTATIVES,
FOREIGN OPERATIONS AND
GOVERNMENT INFORMATION SUBCOMMITTEE
OF THE COMMITTEE ON GOVERNMENT OPERATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., pursuant to call, in room 304 Cannon Office Building, Hon. John E. Moss (chairman of the subcommittee) presiding.

Present: Representatives John E. Moss, Henry S. Reuss, and Ogden R. Reid.

Staff members present: Samuel J. Archibald, staff administrator; Jack Mattison, chief investigator; Benny L. Kass, subcommittee counsel; Marvin G. Weinbaum, staff investigator.

Mr. Moss. The subcommittee will be in order.

Mr. Kass.

FURTHER TESTIMONY OF DR. JOHN I. LACEY, CHAIRMAN, DEPARTMENT OF PSYCHOPHYSIOLOGY-NEUROPHYSIOLOGY, FELS RESEARCH INSTITUTE, AND PROFESSOR OF PSYCHOPHYSIOLOGY, ANTIOCH COLLEGE, YELLOW SPRINGS, OHIO; DR. H. B. DEARMAN, PSYCHIATRIST, JOHNSON CITY, TENN.; DR. JOSEPH F. KUBIS, PROFESSOR, DEPARTMENT OF PSYCHOLOGY, FORDHAM UNIVERSITY; DR. MARTIN T. ORNE, SENIOR RESEARCH PSYCHIATRIST, MASSACHUSETTS MENTAL HEALTH CENTER, AND ASSOCIATE IN PSYCHIATRY, HARVARD MEDICAL SCHOOL

Mr. KASS. Dr. Lacey, could you describe the polygraph that is being used in both the Federal Government and commercial practice today? What are the component parts? How do they operate?

Dr. LACEY. Dr. Kubis would be a better man to address that question to. I repeat that I don't have any personal experience with the polygraphs as used in lie detecting.

Mr. KASS. Dr. Kubis?

Dr. KUBIS. The usual polygraph has three components, one of which measures the cardiovascular responses, another which measures the respiratory response, and the third which measures the psychogalvanic response.

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Mr. KASS. For our record and for our own understanding, can you explain what you mean by cardiovascular, and the other two?

Dr. KUBIS. The cardiovascular response that is usually monitored is an analog of the blood pressure response that a doctor gets when he put a cuff around an individual. A cuff around the upper arm is not essential. You can get a similar response from a finger.

Dr. LACEY. Are they still using a cuff pressure midway between systolic and diastolic?

Dr. KUBIS. That is right. Also the plethysmographic response can be listed as another indicator of the cardiovascular response.

Mr. KASS. My own understanding is completely negative at this point. Dr. Lacey, I have one question for you. You asked "Are they still using this technique?"

Dr. LACEY. It is not a sound physiologic technique, although it might serve a practical purpose.

Mr. KASS. Why is it not a sound physiologic technique?

Dr. LACEY. The usual indirect technique for the measurement of blood pressure with which we are all familiar in clinical practice, wrapping the cuff around the arm and inflation of the cuff upward and letting it go back, depends briefly—how deeply do you want me to go into this?

Mr. KASS. As fully as you can, so that everybody understands.

Dr. LACEY. It depends briefly on the following picture, if you will. The injection of blood into the arterial tree when the heart contracts produces a forcible wave of pressure transmitted down the arterial tree. This wave of pressure, being impressed upon the elastic walls of the artery produces audible sounds.

When the pressure is so high that the sounds disappear, this means that one has imposed an external pressure upon the artery just strong enough to prevent the wave of blood from being transmitted down the arterial tree. This is what is known as systolic pressure.

Then one drops the pressure slowly until either the sound again disappears or until there is a characteristic muffling change, and this is taken as diastolic, a steady state pressure in the cardiovascular system in the absence of the pumping action of the heart.

These, it must be emphasized, are themselves indirect measures of blood pressure. They do not correspond very accurately, although they are very suitable for clinical purposes. This is a point one should make over and over and over again; that things that don't correspond accurately to the physical phenomena we are measuring may still be of clinical usage. This technique does correspond very accurately with what we might get with an indwelling arterial catheter. However, it serves its purpose.

Now then, it is very difficult to continuously monitor blood pressure, either in the case of an investigation in psychomatic medicine or in the case of investigation in lie detecting; first of all, because the continual application of pressure causes pain. One has to release the pressure quite commonly. Secondly, the application of that pressure repeatedly is itself a stimulus and will produce other autonomic responses, such as GSR, if you will, since that seems to be a favorite one.

The technique developed early in psychophysiological investigations was to inflate the cuff to a degree of pressure relatively comfortable for the patient, or the subject, midway between these two end

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points of systolic and diastolic blood pressure. What one gets is a record something like the plethysmographic record in the pages of Dr. Kubis' report, a pulse with an arch coming up and down superimposed upon waves which are thought to reflect blood pressure.

Actually, this record is an extremely complicated admixture of changes in blood pressure and changes in arm volume which, itself, reflects still another underlying physiologic measure.

There are now other and better techniques available. That is why I asked, Is this technique still being used? There are now relatively innocuous techniques available. For example, the monitoring of digital blood pressure continuously. I won't go into the principles of it, but it is much more comfortable for the subject, and one at least gets something that is much more clearly interpretable in terms of underlying physiological processes. In this case one would get relatively continuous measures of systolic blood pressure. It would probably serve better.

Mr. KASS. Do you think that the current methods being used today on this component are practical and will get the same results, or at least will get adequate results for the purposes they are trying to achieve?

Dr. LACEY. That is asking me for a value judgment that I am not prepared to make. Let me answer the question in this way. They certainly are primitive techniques. We have much more sophisticated techniques available today for acquiring and displaying the information. The matter of display is an extremely important one, because what one sees with the naked eye is a matter of how one has transformed the measurements.

I could, without much trouble, itemize three or four different ways, for example, of getting at heart rate and heart rate changes, of which I would consider only one suitable to the problem such as lie detecting.

Mr. KASS. Not as a scientist for a moment, but as a private individual with 22 or 25 years experience using these components, could you make that value judgment?

Dr. LACEY. You want to force me to make a value judgment?

Mr. KASS. Yes, sir.

Dr. LACEY. I have to be what Mr. Reuss calls responsive. I would say, Mr. Kass, in all likelihood, assuming a certain degree of validity under certain circumstances, which would have to be defined for the so-called, lie-detection procedure, I would say it is probably practical but falls far short of what we could do today. That they are practical is evidenced by Dr. Kubis' investigation, to which I must refer. I keep on going back to it. I think it is one of the best studies in the field I have ever read.

You are welcome, Dr. Kubis. We will come to terms later. That is meant very seriously. That they are practical you can see by referring to the monograph by which, with one change, using a finger plethysmograph—we can define that for you later, but it is another form of cardiovascular measurement related to the rate that blood is flowing in the digit—using essentially similar techniques, he was able with his trained graduate students and himself using techniques very similar to it, using techniques which I would still consider rather primitive in terms of display, they were able to do a respectable job, at least in the first of the three studies.

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Mr. KASS. In other words, then, your analysis would be that this component—one of the three that is being used in the polygraph today as a lie detector—although primitive is rather practical.

Dr. LACEY. It is the least practical of the three, but it has some degree of practicality.

Mr. KASS. Now what about the instrument or component that measures——

Mr. MOSS. First, let us find out if Dr. Kubis is in agreement or disagreement with what we have just heard.

Dr. KUBIS. Yes. There are better and more sophisticated techniques that can be used. These usually cannot be packaged for sale at a reasonable price. There is also a hesitancy among manufacturers to try to change, but I don't know what the reason for this is. It may be an investment of money in the types of instruments that are available. It may be the natural lag of manufacturing that always follows advances in science. There are better procedures available, but this is historically the one which has been used; and I would gather that many people feel comfortable with it and have been getting good results with it.

There are a number of good investigators and they continue working with an instrument and with devices that they are comfortable with.

Mr. MOSS. Now when you used the term "There are a number of good investigators who have been getting results with it." Are you talking of the average, typical examiner operating in this country today, not in a laboratory, but out in the field?

Dr. KUBIS. Usually the ones that I have come in contact with have been very good investigators, both from a psychological viewpoint and in terms of operation.

I have a strong feeling that there are a number of individuals who buy these instruments, do not take any training, set up, as it were, a shingle, and operate with this instrument. I came in contact with one around the New York region who, after buying an instrument and working on his own, wanted to sell it to the University at a reduced rate because he was not interested in it any more. He had no training.

These instruments can be bought by practically anyone. Anyone, any university can buy them, because they have been used for scientific purposes in the early history of psychophysiological research. It is these men, without training, without adequate experience, that I have a strong feeling against. I feel there are more of them than we can see and can identify.

I have no difficulty about the men who are good investigators, have been doing good work and whom I have seen in operation. But as for the average examiner, I wouldn't know how many of them had adequate training. We discussed that question yesterday with regard to the agencies which have been using polygraphs. Some records indicate 5- to 8-day training periods. This seems woefully inadequate as a training procedure for an investigator who is going to make delicate judgments. Unless that man has had a strong internship of at least 6 months to a year with a very competent person, working continuously, under strict supervision, one would question whether 5- to 8-day training period would make a polygraph operator.

If there is a large number of these short-course individuals, on the average they should not be as good as those who have been well-

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trained. Our own experience with graduate students, involves a training period of about 1 year super-imposed upon 2 years of graduate work, and laboratory work. The average operator in our laboratory attains an accuracy of about 80 percent.

Now I do not know how this accuracy will project out into the general field. At present any man can become a lie detector expert, whatever that may mean for the moment, by merely having the money to buy a machine.

Mr. KASS. Dr. Kubis, does a 6- to 7-week training course seem any less woeful?

Dr. KUBIS. It would depend on the man. If he had quite a bit of experience in interrogation, working with people, questioning them, understanding them, getting an appreciation of how to phrase questions; and if he had a strong technical training of anywhere from 3 weeks to about a maximum of 6 months, as Dr. Lacey pointed out yesterday, and then had this 6-month training period, I would say a man of intelligence and intuitiveness should be an average type of operator.

Mr. KASS. Dr. Kubis, 6 months? The question was 6 weeks.

Dr. KUBIS. There are two types of training to consider: Technical capability of operating; and the capability of examining a case, phrasing the essential questions, examining the individual, and then interpreting the results.

Now yesterday we distinguished between those two phases. The technical phases Dr. Lacey had mentioned could vary anywhere from 3 weeks to about 6 months.

Would that be right?

Dr. LACEY. I think I would just say in my own laboratories, I wouldn't trust the technician to take good records under 6 months. But that is for different purposes.

Dr. KUBIS. That is many more channels than three?

Dr. LACEY. No. When I was asked a question how many channels I have, I said 19. That is the total capability of the lab. Under no circumstances have I ever utilized all 19 in a single investigation. Just to get decent brain wave records and blood pressure records, and good skin resistance records, and so on, the normal sort of routine measurement we do in the laboratory, I would feel uncomfortable with a technician under 6 months, because there are many artifacts and they have to learn to distinguish them. And it is simply incredible how often I have found that people don't see an artifact; think it is a real response.

Mr. KASS. What is an artifact, and what are the artifacts that can come out? Let us stick to one component right now.

Dr. LACEY. Which one?

Mr. KASS. The cardiovascular component.

Dr. LACEY. Well, there are many. They are quite simple in the case of the cardiovascular component. I can't see how anybody would miss them, once he is alerted to them. Since this method of measurement is, as I have said before, a rather complicated resultant of blood pressure changes, and changes in arterial elasticity, and changes in the volume of the arm. Perhaps I should emphasize that this, too, changes: we don't have constant arm volume, the changes depending on the state of constriction and dilation of the underlying arteries in

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the arm. One could possibly mistake an arm movement which changes the volume of the arm under the occluding cuff, one could mistake this for a response. One could—I don't know one actually does, I was thinking about what the lie-detector people call the "peak of tension" method. Since blood pressure is a constantly changing thing if one monitors it carefully, since the blood pressure cuff is uncomfortable even when set midway between systolic and diastolic, since one person might be quite responsive to this discomfort, might be much aware of it, might resent it, and so on, it is conceivable that this could feed into other channels, let us say the GSR channel which could show a steadily dropping curve of resistance. This could reflect just the increase in discomfort, physical discomfort attendant upon the examination.

May I say, Mr. Kass, that these are not to my mind the more serious disadvantages of the inexpensive polygraph machine, to take acknowledgment of Dr. Kubis' comments. There are many more serious ones. The technique employed by the—I wish there were another name besides calling them polygraph operators or lie detectors—the techniques employed, whether based intuitively or empirically, or on sound scientific reasoning—I am not sure how these have arisen—of repeating questions which resulted in suspicious physiologic perturbations, of juxtaposing critical and noncritical questions, of trying to eliminate surprise responses, novelty responses, these techniques arrived at, as I say, I don't know how, intuitively, empirically, or rationally, do represent to my mind a considerable degree of protection against this kind of artifact.

These artifacts, due to movements, random thoughts, sudden changes in the environment, this kind of artifact—responses evoked by things other than those aspects of the situation in which you are interested—these techniques do provide a considerable degree of protection against them. So, I repeat, what could really be implemented in this field is considerably increased physiologic sophistication, considerably increased physiological instrumentation.

I don't think the matter of cost or ponderosity or pounds of equipment should really enter in here. There are much more serious costs, as we mentioned yesterday, in terms of human lives, human reputations, important decisions to be made for the security of our Nation that, for me, far outweigh the fact that to buy a Fels cardiotachometer costs about $2,500—which, I take it, is several times the cost of a polygraph machine. I am sure the Yellow Springs Co. would be glad to transistorize the equipment so that it may be made into a small package. Now I really feel very strongly about this; that the so-called polygraph machine could be updated markedly. Now this would result in an increase in physiologic sophistication. I would feel much more comfortable interpreting physiologic changes I see on the record. Whether it in fact would increase the validity of the lie-detecting procedure is an empirical matter. I don't know. I do know, in pursuit of my own scientific objectives, which is the understanding of autonomic participation in brain processes, in behavioral processes, that improved instrumentation and display techniques have simply moved us further ahead.

So I think it is possible that it would move the lie detection further ahead.

Mr. KASS. Dr. Dearman, do you agree with the statement made by the other gentlemen?

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Dr. DEARMAN. This is more or less out of my line what they are talking about now. I would say any refined technique for taking blood pressure, respiration, will give better results.

Mr. KASS. Your experience with the polygraph or lie detector has been only in that one example you gave yesterday?

Dr. DEARMAN. That one case, yes.

Mr. KASS. One other question about this component, Dr. Lacey. You say that the pressure curve is relatively comfortable on a person. Are there any side effects which prolonged use——

Dr. LACEY. You mean relatively uncomfortable?

Mr. KASS. Uncomfortable. Are there any side effects which could happen to the person?

Dr. LACEY. You are talking about adverse side effects, medically dangerous?

Mr. KASS. Yes.

Dr. LACEY. You could cut down the blood supply to the extremity after the cuff, to the point where some slight acute problem arises in a predisposed individual, with a preexisting disorder, let us say an early Reynaud's disease, which is characterized by extreme vasoconstriction in the fingertips where the blood supply is completely cut off.

It is possible that such discomfort might trigger an episode such as that. In general, I would not consider this a major hazard. I would be very surprised indeed if, in the run of the mill polygraph examination, if the operators of these machines have run into them very much. Nevertheless, the possibility exists, and there should be some degree of caution exercised.

Mr. KASS. Can anyone recognize these symptoms?

Dr. LACEY. That symptom would be readily recognized, because the patient would say "I hurt. Look at my hands."

Mr. KASS. Dr. Lacey, is it always possible to read the chart of that component?

Dr. LACEY. Definitely not.

Mr. KASS. Could you explain? We have a blackboard here, if you wish to use it.

Dr. LACEY. Yes. Well, you are hitting one of my hobbies.

The polygraph machine—I new this, but I wanted to defer to Dr. Kubis who has had vastly more experience with the machine than I—the polygraph machine has no direct writeout representing one of the important components of the cardiovascular responses; namely, heart rate. What they do is to use the repetitive bumping, which can be seen in this curve—the same sort of thing, if you have Dr. Kubis' report, shown in a plethysmograph—a bumping due to the onslaught of blood into the area underlying the cuff.

They use this as a measure of heart rate. Now it is a measure of heart rate. What is the usual paper transport speed on a polygraph, 5 millimeters a second, or what?

Dr. KUBIS. There is no uniform rate. It depends on what you want to measure. I don't know what the rates are now.

Mr. KASS. We have been informed that it is about 6 inches per minute; whatever that means.

Dr. LACEY. Six inches, did you say?

Mr. KASS. Yes, sir; this is an unverified statement. We will get it for the record.

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Dr. LACEY. A minute, did you say?

Mr. KASS. Yes.

Dr. LACEY. That is fairly slow paper speed. Standard recording techniques would be about 25 millimeters a second, 6 inches a minute is less than 3 millimeters a second. Good, now my argument becomes even more applicable. The 25 millimeters a second is a fast paper speed. This means that one produces miles and miles of swiggles in the course of a day's investigation. Twenty-five millimeters per second is still a slow enough paper speed so that changes in heart rate cannot be apparent to the naked eye. I would quarrel very much, I think, with the simple casual scanning of a record without measurement techniques, and this simplifies what I mean.

Let us suppose that the heart rate were to change from 60 beats per minute in a few cycles to 70 beats per minute. In some individuals this could be a rather—that change in rate at 10 beats per minute could be—significant indication of perturbation. I am trying to find neutral words to describe what is happening. Sixty beats per minute is one per second. Therefore, one would get one bump saying that the heart has contracted and expelled blood into the arterial tree. One second later, or 25 millimeters later, which is approximately 1 inch, one would get another bump.

Now then, let us say that in the very next cardiac cycle—and this could happen, frequently does—what we call the "RR" interval is shortened. This means the interval of time between the electrical signs of contraction of the left ventricle. Within one cardiac cycle that RR interval could be changed to correspond to 70 beats a minute, I think I said.

Mr. KASS. Could this be changed as a result of the stimulus of a question?

Dr. LACEY. Yes. It also could be changed due to respiration, also changed by a stimulus coming into the environment, and so on. Let us say they were examining a young male adult, age 25, 22 years old. Individuals of this age typically are characterized by what is known as sinus arrhythmia, a benign physiologic condition in which there is continuous variation of heart rates in synchrony with the respiration. The heart will accelerate as one breathes in, decelerate as one breathes out. With a typical display such as "EKG" or these bumps, this sinus arrhythmia would hardly be detectable unless one sat down with a plastic ruler and measured these intervals; translated them into periods between heart contractions.

Mr. KASS. But is it a constant thing in the individual?

Dr. LACEY. Yes. What do you mean by "constant"?

Mr. KASS. In other words, will he continually get the same ups and downs, whether it is 60 beats per minute or 70 beats per minute during the 4 minutes he is on the polygraph chart? Or will it be erratic?

Dr. LACEY. There will be variation in the amplitude of this sinus arrhythmia; respiratory synchronous variation. I am not trying to obscure the issues; I am trying to communicate them.

Mr. KASS. The point is that——

Dr. LACEY. There will be variations. This happens to be one of our research objectives at the moment. In our opinion our experiments show that this, itself, is a very important psychophysiological variable.

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The degree of cyclic variation in this sinus arrhythmia is a characteristic that needs to be taken into account in interpreting the record to discover something about psychophysiological status.

This is very interesting. Sinus arrhythmia is supposed to be rather low-level reflection in the sense that the brain mechanism involved are low down in the hierarchy; and yet we find that this has pronounced significance in terms of personality and behavior of the individual.

Mr. KASS. You stated this occurs in persons 21, 22, 23 years old?

Dr. LACEY. It is more typical of individuals in young adulthood.

Mr. KASS. Is it also possible at older ages?

Dr. LACEY. Yes, indeed.

Mr. KASS. It is not unique, therefore, in younger ages? It is a common occurrence also in older age?

Dr. LACEY. Yes, indeed.

I think I can communicate the sense of my argument without actually going through the computation. The change in a given cardiac cycle that corresponds to a rate of 60 beats a minute to, in a subsequent cardiac cycle, a rate of 70 beats a minute represents, in terms of a paper speed of 25 millimeters per second, a rather small change. One would have to have the paper speed going very, very fast in order to detect this change with the naked eye; and it would go so fast it would be spread out over such a large part of the paper that one would still miss it. We can demonstrate exactly what I mean——

Mr. REUSS. Doctor, is a document being passed around? What about identifying it?

Dr. LACEY. I was identifying it, Mr. Reuss.

Mr. REUSS. As what?

Dr. DEARMAN. This is a polygraph record taken by the second polygraph operator on the case I talked about yesterday. This is the actual record.

Mr. REUSS. This is the piece of paper from which they found this fellow guilty?

Dr. DEARMAN. No, sir. Let us back up a little. This is the piece of paper that showed the same reaction at the University of Virginia as he got at the bank.

Mr. REUSS. From which the polygraph operator, I think you testified, said "This is the guy who stole the money"?

Dr. DEARMAN. Yes. In other words, the polygraph operator who came to the University of Virginia after she had run these two records, said "This man is guilty of stealing money from the bank."

Mr. REUSS. Can you show me in this historic document where we have the cry "Eureka" here it is?

Dr. DEARMAN. There is one place here. Here is one place here. Here is one place here, and I don't know whether there are any more or not.

Mr. REUSS. Do you have the questions?

Dr. DEARMAN. I have everything.

Mr. REUSS. When you are through, I would like to have you tell me what the questions were which produced all this.

Dr. LACEY. If one would care to glance at this record, this heavy band of red color that one sees here is, I would assume, the so-called blood pressure record.

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Is that correct, Dr. Dearman?

Dr. DEARMAN. That is correct, and pulse.

Dr. LACEY. Now if one gets a close look at this, one sees very closely spaced here, no more than a millimeter or two apart a series of spikes in a curve. Each one of the spikes represents a contraction of the heart. It is impossible in this display to look at it and say "Ah, hasn't the heart rate changed," because one is making visual discriminations of a spatial extent which is extremely small.

Mr. KASS. At this point, since you are interpreting something, would you read the number underneath there?

Dr. DEARMAN. This is the question number. This is question No. 6, the first one. (See exhibit 20, p. 402.)

Mr. KASS. Dr. Dearman, before we continue, is there any objection on your part, as the psychiatrist who participated in this interrogation and this analysis with the individual, to our stating the question for the record?

Dr. DEARMAN. Not at all. The only thing I ask not be stated in the record is anything about the personal life of this man.

Mr. KASS. Thank you. Question No. 6, for the record—and this is the material which was supplied by Dr. Dearman in "Federal Lie Detector Case, H. B. Dearman, M.D.," confidential report of the entire case which has been documented in an earlier record—question No. 6, "Do you know anyone who has been stealing money from the blank blank branch,"—and this is an identification of the bank—"or its customers?" (See exhibit 20, p. 402.)

Mr. REUSS. What was his answer?

Dr. DEARMAN. His answer was, "No," verbally. The polygraph said, Yes.

Dr. LACEY. At this point, I cannot resist pointing out once more that the polygraph record is neutral. I can look at this record and I can say there is a pronounced physiologic response. This is a point that I think needs to be made over and over again.

Mr. REUSS. What do you mean by saying it is neutral?

Dr. LACEY. It is neutral with respect to the causes of that response. Beyond that point, it is an inference. For example, take the example I gave yesterday. Somebody could give this record to me and say, "Here I administered the cold pressor test," which is a cardiovascular test, as a presumed measure of the predisposition of this individual to develop essential hypertension in later years. If you were to tell me deadpan, without a polygraph being hooked up to you, that this was a record of an individual undergoing the cold pressor test, it would be completely acceptable to me. That is what the response to the cold pressor test looks like.

If you were to tell me that this was a response to a mental arithmetic test that, too, would be completely acceptable to me. That is what the response to the mental arithmetic test looks like.

In other words, a great variety of stimuli qualitatively and quantitatively different from each other produce responses which, by this method of display, are indistinguishable one from the other.

Mr. REUSS. Let me ask some questions, if I may, Mr. Chairman, at this point.

Mr. MOSS. Certainly.

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Mr. REUSS. There is before me a document bearing the name, "Associated Research, Inc., Chicago, Ill." Is that the name of the polygraph?

Dr. DEARMAN. No, sir; just the people who make the paper.

Mr. REUSS. At any rate, we are looking at the squiggles which Dr. Dearman tells us ensued the asking of the question, "Do you know anything about the stealing of this money from the bank?" And the answer, "No." And those squiggles, to the naked eye of myself, who is not a trained polygraph operator, looks as if there is a bulge upwards there.

Dr. LACEY. In 5 days you would say there really was a bulge.

Mr. REUSS. Yes. Anybody could see that.

Now, Dr. Dearman reports that based upon that bulge upward the polygraph operator in this particular case drew the inference that the man was lying and that he did know that money had been stolen from the bank, and that he himself had therefore probably stolen it. On the basis of this, the man was presumed guilty and a confession was extracted, and it looked as if the crime had been solved. It turned out later that there was no crime at all; that no money had been taken.

Now, Dr. Lacey, you point out that the polygraph shows a reaction at this point, but that the polygraph is—as you say—neutral; that it is up to the operator to make the diagnosis of what this means; and that in this particular case the fact that the polygraph operator went too far and made a mistake is neither here nor there on the validity of this particular polygraph reading. Is that a fair recapitulation of what you just said?

Dr. LACEY. Perhaps so. Precise communication is very important at this point. So, may I correct that?

Mr. REUSS. I want you to be precise.

Dr. LACEY. The polygraph operator didn't make a mistake on the validity of the record. The polygraph operator made an inference of some kind. I would suspect this early in the record that any well-intentioned polygraph examiner would have said, "Aha, this is something which should be followed up." I just doubt that anybody who has had any experience in this field, has any good intention or understanding, would say "Here is guilt." He would say, "Here is something to check."

Dr. DEARMAN. There are, I believe, five positive responses, I am not sure, and what she said that day after finishing the test is, "Doctor, this man is guilty of stealing money from the bank and has knowledge of it." On her report to me, she said what Dr. Lacey said. She said that these reactions indicated that this should be gone into further.

Mr. REUSS. Dr. Dearman, I would like to pursue this with Dr. Lacey.

Would you not expect a perfectly innocent man, that is, yourself or myself——

Dr. LACEY. I am not perfectly innocent, sir.

Mr. REUSS. On robbing money from this bank, both of us are. Wouldn't you expect some reaction when a glowering cross examiner says "Was some money stolen from the bank? The reason you are taking the lie detector test is that you are one of the suspects." Would

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you not expect a bulge at that point or at least not be surprised if you saw one?

Dr. LACEY. Yes.

Mr. REUSS. And therefore what is the use of all this? What is the use of this particular question and of getting excited about the answer? If somebody told him he was a suspect and that for his own good he had better submit to the lie detector test, and then he is asked the $64 question involving the very wrongdoing that he is suspected of, I would suspect that he would get some kind of reaction, either anger at being asked this, or, "My God, I did do it," kind of reaction.

Dr. LACEY. Yes, this is exactly——

Mr. REUSS. Therefore, what does all this prove? Why bother with this? Why not find out whether the bank sustained a robbery by more classical methods, like inspecting the bank books and finding out whether money really disappeared?

Dr. DEARMAN. Let me say this to clear up the record. When these tests were made at the bank, no money had been stolen. This was a routine check made at the bank. No money was missing. Everybody was going to take the lie detector. When the vice president was asked these questions, he got these responses. This record is not the record made at the bank. This is the record made at the University of Virginia on February 28, 1962, which is about 3 months later.

Mr. REUSS. After he had been under suspicion?

Dr. DEARMAN. He was not under suspicion at the time he took the test, but it was after he got the positive responses. No money was missing. This was just a routine check. The bank had had some people steal from this bank, some of their employees. The bonding company recommended to the bank that they hire a lie detector agency to come in and do this work for them on a routine basis. I believe this was to be done twice a year. This was the first routine check.

Mr. REUSS. This document you have in front of you is a second check of this man?

Dr. DEARMAN. That is right.

Mr. REUSS. Taken 3 months after the first check?

Dr. DEARMAN. That is right.

Mr. REUSS. Didn't the first check show some suspicious bulges?

Dr. DEARMAN. The first check showed exactly what this shows.

Mr. MOSS. Let us clarify this. In this particular case, Mr. Reuss, following the first polygraph examination, this particular officer of the bank—because of the readings of the polygraph and the interpretation placed on those by the examiner—confessed to having taken money. He subsequently was placed under the care of Dr. Dearman for psychiatric treatment. This second test at the University of Virginia was given following approximately 3 months of treatment where he had, through careful analysis, become aware of personal problems going back many years. These problems had apparently caused the autonomic reactions which led to a conviction on the part of the operator in the first instance and the subject in the second that he had in fact taken something.

Dr. DEARMAN. Yes.

Mr. MOSS. At this point, the second test was part of your treatment of the individual?

Dr. DEARMAN. Not my treatment.

Mr. MOSS. Further analysis?

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Dr. DEARMAN. That is right. I made a hypothesis of what would happen if he took another polygraph test, and I was checking on my hypothesis.

Mr. Moss. This test was one prepared by you?

Dr. DEARMAN. I took the nine questions that were asked the man the first time and asked them again. The reactions we got here are the reactions to the first nine questions.

Mr. Mos.. In the second instance this test was not prepared by the second polygraph operator?

Dr. DEARMAN. No, sir; prepared by me.

Mr. Moss. And it was administered in accordance with your instructions?

Dr. DEARMAN. No, sir. I told the polygraph operator that I wanted her to carry out this examination as she would any other examination.

Mr. Moss. But to the extent that she carried out this examination prepared by you, she was not exercising her own judgment as she might have in a case not prepared by you.

Dr. DEARMAN. That is right, except she did ask permission to ask two or three other questions which I told her she could.

Mr. REUSS. At the time of the second polygraph examination which we are discussing, did the subject of this polygraph examination have some idea that he was in trouble?

Dr. DEARMAN. No, sir. He felt like he was not in trouble. He felt like we had found the answer to why he got the reactions on the first test. But even though he felt this, the autonomic nervous system still responded like it did 3 months before.

Mr. REUSS. I note from the polygraph operator's notes which are coordinated with the chart which we have just been using that question 6, which I believe is the question that adduced the——

Dr. DEARMAN. That is one of them.

Mr. REUSS. That is one of the questions that adduced the reaction that Dr. Lacey has just been describing. I note the following entry. Here's a question, "Do you know anyone who has been stealing money from the blank blank branch or its customers?"

Then there is a notation by the polygraph operator, "Blood pressure, pulse positive, strong. Breathing pattern positive. Sweat gland activity positive. Conclusion," and this is checked, "specific reaction indicative of deception, without verification through interrogation." (See exhibit 20, p. 402.)

Dr. DEARMAN. Yes.

Mr. REUSS. Well, this, it seems to me, is a very plain straightforward case of a polygraph operator who came to a wrong conclusion.

Dr. DEARMAN. That was my conclusion.

Mr. REUSS. That is to say, the operator concluded that the subject was guilty of deception at this point when, in fact, later evidence shows that he was not guilty of deception. Is that not so?

Dr. DEARMAN. Yes.

Mr. REUSS. This seems to be the case, is it not, Dr. Lacey? Assuming the man was innocent, as is strongly hinted by the fact that there wasn't any wrong doing for him to have been guilty of, this conclusion that he was guilty of deception was wrong, was it not?

Dr. LACEY. Will you permit me to answer that question at some length and in my own terms, sir?

Mr. REUSS. Yes.

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Dr. LACEY. This is an extremely interesting example of two things; first, the fact that the so-called polygraph examination in proper hands turns out to be an extremely reliable thing; secondly, it illustrates one of the reasons for the impassioned speech I made yesterday that the inference to be made from the polygraph records is just that, an inference, that it must be checked by other investigative means, that a decision of—I hate to use the words "guilt" and "innocence," I will explain why—a decision of guilt and innocence remains, as it properly should be, in my view, a legal matter.

Now then, the fact is that on two separate occasions 3 months apart, if I understand this case correctly, on two separate occasions 3 months apart, excessive physiological reactions were obtained through a certain set of symbolic stimuli, a certain set of questions. In semilay, semiscientific language this would mean that these questions had some specific differential value to that person.

Now let us see what inferences can be made from this.

It raises the presumption of what the lawyers would call guilt; that is, a presumption that this man did in fact steal money, but only a presumption. It raises the possibility of a second inference, one that Mr. Reuss was trying to elicit before, that this individual is so sensitive to all kinds of accusations that any question given to him by a glowering examiner, I think was Mr. Reuss's phrase, that any question which the subject perceived as questioning his integrity, as leading to a bad attribute, would produce these physiological responses and, as any psychophysiologist would know, and as Dr. Dearman apparently has demonstrated in this case, it raises a third presumption that possibly there is some neurotic interconnection of affect and ideation concerned with this question.

A properly trained and supervised polygraph operator, in my mind, should have said nothing more, just as my technician will report to me nothing more than the numbers that result from a test or as the nurse in the clinic will report only the result of how much sugar is in the urine, and so on. They must never make the diagnosis. I don't like the word "diagnosis," but the analog.

The polygraph operator should have said simply: "There is an excessive physiological reaction to these things."

Now, in my view, a properly utilized polygraph examination, shown in this case to be reliable, you see, in the sense that the results are reproducible—that is what should be meant by reliability—a properly conducted investigative network, if I may use that phrase, would have said, "Aha, let us go check. There is too much affect about this case, may I say." Indeed, that is what happened. People did check. You, yourself, went to the president of the bank, I think you said.

Dr. DEARMAN. Yes.

Dr. LACEY. A check of the books now revealed this man could not have stolen the money in the way he so stated, because the books showed no such tampering. The money was not missing. Wonderful. Now, then, it seems that by more classical means—by other means, I would prefer to say—one of the presumptions of the three that I raised, and there may be others, one of the presumptions was ruled out, this man did not in fact steal the money. Therefore, we have other presumptions that this man is excessively sensitive to any questions implying threat or that there is some neurosis here.

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To Dr. Dearman's credit as a psychiatrist, he detected the possibility of some neurotic interconnection, some displacement, some condensation of the symbolic stimuli involved, and proceeded to track it down. Within the limits of clinical judgment and within the tests you produced and which you predicted would change the polygraph record in certain ways by changing the nature of the questioning which was a very logical and scientific thing to do, Dr. Dearman was able to arrive at a conclusion which seemed to him, and to me, much more in accord with the facts, that we are here dealing with a neurotic individual.

I say again the case exemplifies two things; under proper conditions, the polygraph examination proved reliable, and that an intelligent investigation ruled out two of three possibilities—there may be more—and came to a correct conclusion.

Mr. REUSS. Now let me ask this question since I think you have stated your answer. Bearing in mind the whole case, however, that the bank had not had any thefts from it and that the bank then administered this test to an uncounted number of its employees. And in this case, although the man falsely accused by the polygraph operator did not, thank God, go to jail, he does seem to have required psychiatric treatment, and so on, and has spent an awful lot of time fussing around with this. Wasn't this whole procedure asinine? What do you have to say—as a citizen and expert—on the bank subjecting its people to this sort of treatment?

Dr. LACEY. I will repeat what I said before.

Mr. REUSS. Why should we have had a polygraph here at all?

Dr. LACEY. Oh, there are many answers to that. Dr. Orne's point yesterday, with which I heartily agree, was that we must acquire information if we can show that it is reliable and valid information.

Mr. REUSS. That a bank should——

Dr. LACEY. May I finish?

Mr. REUSS. But I would like you to be responsive to my question which is whether in this particular case it seemed good policy for the bank to put all its employees to this test without there having been any loss or defalcations.

Dr. LACEY. I have not changed my opinion since yesterday at which time I said that the so-called lie detector procedure may well turn out to be a useful channel of access of information.

In the present state of knowledge, the number of false positives and false negatives are likely to be so large, that the risk to an individual's life and reputation are so great, that the invasion of privacy is so great, that it should be used only with the greatest caution when other considerations, such as vital security of our Nation enters the picture.

Now, I am prepared to be responsive. If you ask me, should this man have been administered on a routine basis polygraph checks—am I correct, is that what they do?

Dr. DEARMAN. Yes.

Dr. LACEY. I say, no, sir; they should not have. But the reason you find me squirming and resisting the words you use, such as asinine and unscientific, is that I do not believe the procedure is asinine or unscientific. I think one has to arrive at a balanced judgment of what is going on, that it should be used only with the greatest of care.

I do not have an axe to grind for the polygraph operator. I am not one. I do have an axe to grind, frankly, for the utilization of an

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objective physiological measurement in the interpretation of what is going on in human behavior. This, I devote my life to. It is a very dangerous venture in our current knowledge. It is beset with many, many hazards. But it can be a useful tool in proper circumstances. I don't agree that routine preemployment screening in a department store is a proper circumstance. I am sorry if this puts some people out of business, but I simply don't agree with that.

If I were a polygraph operator and doing this, I would simply resist the temptation to say anything other than there looks to be excessive response to these stimuli.

Let us investigate further. I certainly would not permit any such record coming out of my laboratory to become part of anybody's dossier.

Mr. REUSS. If that is all the test can elicit, namely, a bump in the squiggles, which could lead to the inference that a man has stolen something or is guilty, or that he is innocent but angry about the questions being asked or, thirdly, that there is some neurotic interconnection there, the three hypotheses you suggested, it really does not seem worthwhile for a bank to give this kind of test, quite apart from the human rights and indignities involved, does it?

Dr. LACEY. That is a kind of loaded question.

Mr. REUSS. The information you get is so vague that——

Dr. LACEY. Sir, that is not vague information. Those are all specifically testable hypotheses. Were they not, Dr. Dearman would not have been able to publish his paper.

What you mean is that there are several possibilities which must be ruled out. An X-ray examination, a gastrointestinal examination, all of these raise several possibilities.

It is the job of a good clinician—in this case it would be the job of a good legal staff—to arrive at the conclusive significance of this indication.

Mr. REUSS. You know beforehand that the sample, let us say, of 20 people that you are going to give this lie detector test to at the bank contains some potential criminals. You could have said without any lie detector test that of a thousand employees, let us say, one or two or three will have criminal tendencies and larceny in their heart. It seems to me that giving them lie detector tests which show that some of them may either have (*a*) larceny in their heart; (*b*) a feeling of anger about having their integrity questioned; or, (*c*) some neurotic intervention, really does not accomplish very much.

Mr. MOSS. Could we permit Dr. Dearman to make a response?

Dr. DEARMAN. I want to point out that this shows something more sensitive than Dr. Lacey has recognized in the fact that he said, I believe, the glowering examiner brought up in regard to stealing.

This man only got positive responses to the questions which had the word "customers" in them and both mother and wife were customers of the bank. He felt that he had symbolically stolen money in the amounts they said from mother and wife.

If you asked him about stealing from the bank, he gets a negative response. If you put "customers" in there, he gets a positive.

Mr. REUSS. That is the neurotic interconnection that Dr. Lacey mentioned.

Dr. DEARMAN. Yes. But he would not respond to all things about guilt, is what I am trying to say.

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Mr. REUSS. Let me ask Dr. Kubis a question. You said, I think, Dr. Kubis, that quite apart from these laboratory tests—the make-believe situations which have produced good results in a number of cases—that in the field in actual practice there have been some investigators who have been getting good results.

Did I understand you right? Were talking about the field, in actual lie detection?

Dr. KUBIS. That is right.

Mr. REUSS. Would you give me the names and addresses of all investigators and polygraph operators whom you feel have been getting good results, and tell me on what you base your opinion that they have been getting good results? Just list them. Let us get their names and addresses first. Then we will go back over and ask you for the basis on which you form your conclusions.

Dr. KUBIS. Right. There is a former director of the State police laboratories, Mr. Kirwan, K-i-r-w-a-n, William.

Mr. REUSS. New York?

Dr. KUBIS. New York. And there is Dr. Fabian Rouke, R-o-u-k-e.

Mr. REUSS. Where is he?

Dr. KUBIS. He is in New York.

I will stick to those for the moment.

Mr. RUESS. If we can, I would like to have you name all of those, if there are any others. Then I would like to take you back through them.

Dr. KUBIS. I would prefer to stick to those first.

Mr. REUSS. Stick to those two?

Dr. KUBIS. Yes, sir.

Mr. REUSS. What is your observation of William Kirwan and the results he has obtained?

Dr. KUBIS. He had been doing work in the State police, examining individuals who had been suspected of various types of crimes. In discussing the cases with him, in studying the records that he had produced, and in evaluating the postexamination by the police department of the additional facts that had been adduced, it is my opinion that he was getting results that have been well above chance. He had been getting not only confessions but verifications of some of his results by additional evidence obtained after the examination.

Mr. REUSS. Have you examined into these specific cases, so as to make a judgment both ways? That is, was there an absence of inference from the polygraph test which imputed guilt to people who, in fact, turned out not to be guilty, and was there a presence of the reverse; namely, the polygraph inference of guilt when the person in fact later was found to be guilty?

Dr. KUBIS. In the records that I have looked into, I have examined those which had been verified and I have not been too much interested in those which still were awaiting the gathering of additional evidence.

In those which have been verified and which I have examined, he had not made any mistakes.

Mr. REUSS. How many did you examine?

Dr. KUBIS. I examined about 30 records.

Mr. REUSS. Did you select them or did he select them?

Dr. KUBIS. I asked for a set of records that had data on them, pre and post.

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Mr. REUSS. However, as far as you know, he could have just handed you 30 that worked and not handed you an equal number that had not worked?

Dr. KUBIS. I don't know the complete basis of his selection, although I do know that on other cases he has submitted material on which he could not make a judgment and both of us evaluated the records and found that both of us could not make a judgment.

Mr. REUSS. But in those cases, he did not make a judgment that turned out to be the right judgment?

Dr. KUBIS. That is, he should not have made it. In the work of lie detection, there should be a nondecision region for those cases where the records are indeterminate. It would be expecting too much of a machine of this sort to always obtain exceedingly good records, uncontaminated by the excitement of such examinations, uncontaminated by the suspect's present state and emotional condition, uncontaminated by other influences over which he may not have had control. Consequently there will always be a number of records on which the examiner will be in doubt as to the judgment he is supposed to make.

Mr. REUSS. As to Dr. Fabian Rouke, did you examine any of his cases?

Dr. KUBIS. Yes.

Mr. REUSS. How many?

Dr. KUBIS. I should say about the same number of cases.

Mr. REUSS. As in the case of William Kirwan, did you simply accept from him a sample of cases which he handed you for examination?

Dr. KUBIS. Yes; and I went to his laboratory and looked at them, myself. There I looked into the files and selected those that I wanted to look at. In effect, it was an examination of those records that he showed me, himself, and those that I selected from his files.

I should like to bring a point very strongly to the attention of the committee and those who are interested in this work. There will never be a perfect instrument. We will have to live with the fact of error and the fact that we are limited, human individuals. Not only are we working with machines that have an instrumental error, but with human individuals who are susceptible to human error. We have to accept these facts.

What we have to look for is whether these types of procedures, as adjuncts to any investigation, will give us significant information over and above the amount of information that we already have. To expect perfection of an instrument when we do not expect perfection of ourselves or to expect perfection of an operator when we ourselves are fallible in our decisions, I think is an unfair expectation.

Along these lines, to create an impression that a procedure is no good because there are mistakes and in this particular instance, on the basis of a single case, is like saying the whole thing is no good at all. Such cases of error will always exist as long as the human individual is alive and will be making judgments.

Mr. MOSS. Don't you think we have another decision that we must make, whether it is necessary to tolerate this method of invading the privacy of the individual, whether the need for it is so great that our society must tolerate it? Yesterday, I think it was the consensus of the panel that there were areas of our national life where our security was involved, where we might have to tolerate this. But the pattern at

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the moment is one of a rapid growth and expansion of the use of these imperfect instruments in the hands of inadequately trained, imperfect individuals. This constitutes a major invasion of the privacy of individuals not even suspected of crime, where the price they must pay for seeking employment is the probing on a broad basis in not only their conscious but their subconscious mind, where dossiers are built up and transferred from one employer to another and permanent prejudice can be created.

Can we tolerate this in our society? Should we tolerate it?

Dr. KUBIS. We should not tolerate such invasions when the matter under investigation is not serious from the point of view of the social obligations that that individual has to maintain or live up to in that society.

There should be serious matters for a lie detection examination. I am very strong on that point, myself, Mr. Moss. I don't believe they should be used in trivial cases. I do not believe there should be continual checkups. I am strongly in disfavor of its use as preemployment screening for types of jobs that don't seem to have serious matters connected with them except for the loss of limited and sometimes trivial amounts of money or property.

As you have said very rightly, Mr. Moss, this is a matter of weighing money against the reputation of an individual, and you cannot equate these two variables.

The reputation of the individual, his dignity, have to be protected and maintained.

Mr. MOSS. This can become very insidious, can it not, if you have an employer in a community who routinely screens applicants through a polygraph. Now, most applications for employment contain a question, "Have you ever been refused employment? If so, will you give the details?" Now, if this employer who refused to employ an applicant on the basis of a polygraph examination should be referred to later, does he say that "I refused to because he could not pass a polygraph test."?

Dr. KUBIS. This is a very unethical use of the polygraph. Even if it had been an occasion where in the individual failed to meet certain requirements, this still does not imply that that individual in any way has done anything wrong. Even if he has done something wrong but has paid his debt to society, it is also a matter of ethics whether such information should be used in ordinary types of employment.

This is a problem which an ordinary employment interviewer is faced with in working with people who have returned from prison. It places a great responsibility on the interviewer to decide whether he should give this information to an employer. In most cases the interviewer is correct if he does not give this information to an employer provided that individual meets all the requirements of the job and provided this does not involve any serious security matters to the detriment of the societal structure into which he is entering again. This type of information should be disseminated just for the sake of blackballing this individual from other types of jobs.

Mr. MOSS. Well, I sense a broadening here of the possibilities of justified use. I thought that we had agreed that it would be in those areas where the security of the Nation might be involved.

Dr. KUBIS. That is right.

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Mr. Moss. Yet, I dare say that its use today in preemployment screening, where there is a remote connection with the security of the Nation, is almost an immeasurable fraction of the total.

Dr. LACEY. I would like to say two things. You may remember—I can't remember, sir, whether you were here or not—I agree for my money, as far as I can see, the only justifiable use of lie detector—the only one I would feel comfortable with perhaps is what I should say—would be where the need is great, as is the case where the vital security of our Nation is concerned. Here I would say that the use of the polygraph technique or kindred techniques is far from asinine. But, sir; whenever that statement is made, then the additional statement is also made that this has to be protected by tight, legal procedures, that this technique should be viewed as is a clinical technique in medicine, as one piece of information to be integrated with many other pieces of information by as skilled, as experienced, as human a person as can be obtained.

In our democracy, the adjudication of guilt or innocence is a matter of due process, it is a legal, judicial procedure, and it should always remain so.

The second thing I would like to say is evoked by the talk about the insidiousness of the technique. This aspect of it has not been touched on yet in these hearings. In casual conversation last night with a gentleman, he informed me that—I don't really remember all the details of the thing, but it ran something like this. Some crime had been committed in some industrial organization. This gentleman found, much to his surprise in questioning a large number of responsible labor representatives, that a very large number, a very large proportion of these said, why, of course, a polygraph examination was acceptable to them.

This raises the question of the public view, the uninformed public view, I may say, of the so-called polygraph examination.

I consider it a degradation of a scientific procedure, and I repeat, Mr. Reuss, this is basically a scientific procedure, I consider it a degradation of a scientific procedure when the public or people subjected to this procedure are misled as to what is involved.

I strongly would like to see widespread dissemination of the fact that this is an imperfect tool, that false positive errors occur, that false negative errors occur. So that an individual never approaches the examination with the understanding that he can't beat the lie detector. This is practically a forced method of eliciting a confession, if my understanding of the field is correct, and I hasten to say this is not based on my personal experience. But if it is indeed true that a polygraph operator says, "This shows you are guilty," and thereby elicits a confession, I am afraid I react very strongly against that procedure.

Now let me point out, and this is a social decision which must be made, that if this information were widespread, if indeed an individual taking a polygraph examination felt that the lie detector was not unbeatable, that it was a record of physiologic responses which change under a variety of conditions, this may lower the validity of the lie detection examination in practical matters. In all ethical views, I think, unfortunate as this may be for the practitioners of lie detection art, this is the only justifiable, democratic ethic.

Dr. DEARMAN. May I say something at this point?

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Mr. Moss. Certainly.

Dr. DEARMAN. It seems that Dr. Kubis thinks that I put a lot of emphasis on this being a single case and we should not draw so many conclusions from it. In medicine, when I discover something, it should be reported, as far as I can see. If it is no good, somebody is going to find out it is no good and they will tell you about it, but if it is good, you get verification.

The only thing I will say about the single case is that this is the first one ever reported. It has brought out information that heretofore I could find nothing about in the literature. And, in my mind, it should raise a doubt in all scientists about such a procedure.

Mr. REUSS. May I ask a question of the panel?

Mr. Moss. Dr. Kubis wishes to comment.

Dr. KUBIS. I have no objection about a single case because all single cases in the negative should be reported and should be studied so that further information can be gained as to why a mistake has been made. This is absolutely essential. In this particular case, I feel it was a very poor question.

Has Mr. Kass the question?

Mr. KASS (reading).

Do you know anyone who has been stealing money from the (blank) bank or its customers?

Dr. KUBIS. Yes. This could involve many things. Do you know whether anyone has been stealing from the bank? Do you know whether anyone has been stealing from its customers?

I presume there are lots of customers of the bank. It is a twofold question, therefore, first, with respect to the bank and with respect to the customers. Further, a question of this type is poor from another point of view. It could be used as an introductory question, because if money is ever missing people have suspicions. We have to distinguish between a suspicion and definite knowledge. Consequently a question of this sort should have been preceded by—does he suspect, and thereby—does he know? If the examiner equates the two words "know" and "suspect," he is going to get the same type of answer. Suspicion is not knowledge. In this particular case, the second alternative, namely "customer," as Dr. Dearman pointed out, was the essential point in his question. If an interpretation were to be made of this issue, it should have been partialed out into at least four components and studied singly thereafter. It is a very bad type of question, and I think everybody would agree that it encompasses too many things. As for the bank situation, I have been given to understand that there are small loans—I would say they are not pilferings for I have been told that they are loans—that some tellers make from a bank over a short period of time, say a day or two. They usually return this loan to the bank. I understand that this practice is more prevalent than the banks are willing to admit. These people, when examined, will give high reactions to such questions as: "Did you ever take or do you know if anyone has taken any money or stolen any money?"

Dr. DEARMAN. Let me say this: this question No. 6 is one of five questions in which a positive response was obtained. This is not the only question. I would like to answer Dr. Lacey on one thing. Let me see if I heard you right.

Did you say last night you were talking with members of labor? How did you phrase that?

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Dr. LACEY. This man referred to the fact that he was talking to labor representatives.

Dr. DEARMAN. They said they had no objection to its use?

Dr. LACEY. That is as I understood the reply.

Dr. DEARMAN. In 1961, an employer here in Washington, D.C., was giving polygraph examinations to prospective employees. In this they asked questions which, in their mind, would determine whether or not this person was prolabor or antilabor. Every time they found that the answer would seem to indicate the fellow was prolabor, they would not hire him. Somebody caught on to this and went before the National Labor Relations Board and they outlawed the use of the machine in this type of work.

Maybe they don't object to it, but they did in this case.

Mr. KASS. Did they outlaw the use of the machine or did they outlaw the use of that specific question?

Dr. DEARMAN. They outlawed the use of the machine in preemployment in this manner.

Mr. KASS. Do you have that citation?

Dr. DEARMAN. I don't have the citation, as such.

Mr. KASS. Do you have the brief?

Dr. DEARMAN. I can get it for you. I don't have it with me.

Mr. KASS. Can you supply it for the record?

Dr. DEARMAN. Yes.

Mr. MOSS. Is it a National Labor Relations case?

Dr. DEARMAN. Yes, 1961.

Mr. MOSS. You have the reference to the case? I think it would be more convenient for the staff to secure that for the record than it would be to place the burden on Dr. Dearman.

Mr. KASS. For the record, Mr. Moss, may I supply it?

Mr. MOSS. I am pleased to see that the staff has anticipated the requirement of the committee.

Dr. DEARMAN. No, sir; I don't have it. I can get it.

Mr. KASS. Was that a 1961 case?

Dr. DEARMAN. 1961.

Mr. MOSS. We will hold the record to receive the citation and the summary of the facts of the case. (See exhibit 21, p. 409.)

Mr. MOSS. I think now if we can get back to Dr. Lacey, to the discussion we had over the interpretation of the graph you have now before you, some of the problems of visual interpretation.

Dr. LACEY. Yes. If you were to examine this closely, Mr. Moss, you would see a series of spikes on this record. Each of the spikes represents a moment in time, somewhat later due to the technique, in which the left ventricle of the heart contracted. You will see they are extremely closely spaced, that at that time when the blood pressure went up quite markedly, there was also a diminution, a decrease in pulse volume, I am certain that there are cardiac rate changes in here. That is to say, a proper display would have shown increases in heart rate. They are extremely difficult, even impossible for me to see here by the naked eye, simply because my eye would have to resolve extremely small spatial distances and would have to contrast extremely small spatial distances.

If one also looks at this record, I notice above it a tracing which must be the skin resistance tracing.

Dr. DEARMAN. Yes.

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Dr. LACEY. This skin resistance tracing does not show any such pronounced perturbation. This raises several issues. Somewhat later I am certain I can go through here and find skin resistance changes and not find blood pressure changes.

This raises many, many issues in an area that I have called response specificity, namely, the possibility of the existence of favored channels of expression between individuals.

One individual may be primarily a blood pressure reactor; another individual, a skin resistance reactor, and another individual blood flow reactor. In another kind of specificity, we also speak of the specificity of the pattern of response to the actual stimulus situation.

Some stimulus situations can be shown to evoke a characteristic pattern of activity. Nobody has been able to demonstrate to date—perhaps because nobody has really studied it yet—that there is a pattern of activity characteristic of that complex of states we call lying.

It might be possible, Mr. Moss—I emphasize the "might"—that the lack of a skin resistance response here to this same question—even at very close inspection I am not sure that there is a very marked heart rate change here—that the lack of two additional indicators of response, right then and there should have raised the suspicion that there was something funny here, that this was not, let us say, the typical kind of response to be expected of an individual who had stolen from the bank. One would have to have extensive norms in the proper utilization of this technique through all kinds of questions. One channel failed to respond, the skin resistance channel.

There are changes in respiration which don't look very much different, by a quick scan, from the changes in respiration that occurred to other questions.

Mr. KASS. Excuse me. Are you reading from question No 6?

Dr. LACEY. I was looking at question No. 6 and contrasting it, Mr. Kass, with the respiratory changes—I was looking at that moment at questions 8 and 10.

I notice question 8 did give a skin resistance change.

Mr. KASS. Could you analyze question No. 6?

Dr. LACEY. Yes. This is the question where I am saying we have a marked blood pressure response. A heart rate response is either absent or is difficult to discriminate. There is a lack of skin resistance response. A response in respiratory volume, at least, which is no different from the response in respiratory volume in other questions as I glance down here. In other words, the big change is this one blood pressure change.

Mr. KASS. What you normally call GSR, or what is called sweat gland activity, is negative at that point.

Dr. LACEY. It is negative. Let us not call it a sweat gland activity. But it is negative.

Mr. KASS. Sweat gland activity was quoted from the polygraph examiner.

Dr. LACEY. That is a fairly outmoded interpretation of what is skin resistance.

Mr. KASS. Dr. Dearman, you included in the material that you supplied the subcommittee a list of questions. The question is stated on one side of the page. Blood pressure, pulse, breathing pattern, sweat gland activity is listed in three separate columns. In the

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second column over is positive, positive, positive. The third column over is "Strong" and that is in parenthesis opposite "blood pressure, pulse." Is this the record submitted by the polygraph examiner in your experimental case? (See exhibit 20, p. 402.)

Dr. DEARMAN. This is a copy of it.

Mr. KASS. This is a copy of it?

Dr. DEARMAN. Yes.

Mr. KASS. Let the record show at this point that all three responses—blood pressure, pulse, breathing pattern, sweat gland activity—are noted here as positive.

Will you continue, Dr. Lacey?

Dr. LACEY. Yes; I got sidetracked. We were talking, I believe—Mr. Moss and Mr. Kass—about the display problem. I cannot distinguish the heart rate response here. It may be in here.

Now, if I understand the intent of your question, Mr. Kass, that skin resistance was rated as positive, it may well be positive in other questions.

Mr. KASS. No; it is listed specifically at question No. 6 in the second test which, I believe it was stated for the record, is that chart you have now.

Dr. LACEY. I would not view the skin resistance change I see here as a positive response. It is a perfectly normal spontaneous reaction of skin resistance, as I see it.

We are talking about the display problem. The mere fact that this inexperienced witness looking at the record did not detect skin resistance response, did detect a respiratory response which, on casual visual investigation of the record, is not diagnostic of anything, and did detect only the differential blood pressure response. All this raises the presumption that increased coverage and more precise display of these physiological responses might result in some increase in precision of the technique.

I would be almost certain, seeing this large blood pressure response, which looks to me as a large blood pressure response—I have no calibration here to tell me how big a response in numbers of millimeters of mercury, but this is a big response—I would asume that a simultaneous record of heart rate would have added corroborative or noncorroborative evidence.

Now, the display of heart rate that must be chosen is one that is not dependent upon paper speed, you see. It is one which must be as interpretable as the skin resistance response is.

Typically, this is a very clean-looking thing at this degree of sensitivity so that one sees big responses in skin resistance.

Mr. KASS. To clarify one additional point, could the skin resistance activity or GSR and the positive reaction from it have been visually noted from the interrogation room? In other words, can you see skin resistance other than through your components?

Dr. LACEY. You have to have a meter. Properly, it is measured in an electrical unit, either ohms or in the preferred way, the reciprocal of ohms, conductance. It is an electrical measure. It reflects certain electrical properties of the skin which are of great interest to the psychophysiologist.

Dr. DEARMAN. Dr. Lacey was talking as to his knowledge. He didn't know about the fact that the examinee was told that the machine was perfect, that he couldn't beat the machine.

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I would just like to read to you from "Principles of Legal Medicine," edited by Geoffrey Mann, Department of Legal Medicine, Medical College of Virginia, Richmond, Va., entitled: "Detection of Deception." It is written by Robert B. King, captain of Virginia State Police. In this he says:

> A great deal of emphasis must be placed upon the ability of the examiner who must be tactful, persuasive, and mentally alert at all times. The examiner should talk with the suspect in the examining room for some time before the examination is made. He must convince the suspect that the lie detector is going to work and it is impossible to beat it. The suspect must realize that if he lies during the examination it will be recorded on the machine.

Mr. KASS. Dr. Kubis, did you agree substantially with the conclusions that Dr. Lacey made in his interpretation of question No. 6 on that second chart?

Could I ask you this, Dr. Lacey, while Dr. Kubis is looking at the chart for a minute. Dr. Lacey, could you continue for our record your point about the heart beat increasing from 60 to 70 beats per minute?

Dr. LACEY. I was simply pointing out that that change within 1 cardiac cycle of 10 beats per minute might be a rather significant change one would like to be able to detect. With this method of display, it would be very difficult to detect that change. With a little electronic processing of the data on the line, to translate each of these cardiac cycle times into a rate or a period, one could then plot this along the up-and-down axis of the paper and get a display which would be visually recognizable, independent of paper speed. It is one of the points I make about the relative degree of primitiveness of this kind of instrumentation.

Mr. KASS. Would the heartbeat, which is increased the same 10 beats per minute from 120 to 130, show the same point you are talking about?

Dr. LACEY. You have been reading, Mr. Kass.

Mr. KASS. No; listening to you earlier.

Dr. LACEY. No, sir; this is one of the reasons why we must substitute measurement techniques for visual analysis techniques.

The magnitude of the evoked response in a variety of physiological systems depends unfortunately to a variable extent, depending on the experimental condition, upon the level of physiologic function at the time the stimulus was administered. Let me take a very simple example, and let me use an explanation of the phenomenon with which I do not agree. To give you an explanation with which I do agree would involve us in a long discussion, and it is beside the point. The phenomenon still exists, whatever its explanation: If, for example, at the moment a question is administered, the subject's heart rate or blood pressure happened to be rather high at that moment, high for him now—and you see we don't know what high or low is for him, we just bring him into an exciting situation, and start administering an examination—if the individual's blood pressure or heart rate or what-not, blood flow, were high at that moment, the administration of an exciting stimulus would result in an absolute or percentage change that would be less than that elicited by that same stimulus at a lower level of functioning. There are ceilings above which our body regulatory mechanism will not permit our heart rate or blood pressure to go—there are brakes built in, homeostatic mechanisms—maintaining

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a regular state of function. So that if the individual's heart rate is high at the moment of a stimulus administration, the compensatory regulatory mechanisms within the body will prohibit a large response. It will in effect say: I will not permit your heart rate to go above 120 beats per minute and I will do everything I can to push it back down. I will not permit your blood pressure to go over 192 millimeters of mercury systolic. A variety of bodily mechanisms will be brought into play to bring the blood pressure down.

As a matter of fact, some of the diseases with which we are concerned today, hypertension, various forms of cardiovascular diseases, can be termed a failure of these homeostatic mechanisms. That is how serious they are. They are constantly at work.

Now, unless techniques are found, they don't exist today, except in highly specialized laboratory experiments, unless techniques are found to evaluate to what degree this individual obeys this so-called law of initial value in which the magnitude of response is less the higher the prestimulus level—and this is an individual characteristic—and unless we learn how to take this into account in the measurement of the response—the measurement, not the visual analysis—unless ways are found to take this into account, the error is going to be proportionately greater.

Let me say again, however, what I said before. Either intuitively or empirically or rationally, the people operating this machine have arrived at partial protection against this sort of error: juxtaposition of critical and noncritical questions, all this sort of thing.

However, it is only partial protection. Appropriate displays would help. For example, let us take the case of heart rate. One could display the changes in cardiac cycle time as a change in cardiac period; that is to say, as a change in the time interval between successive contractions of the heart; or one could display this by converting—electronically on-the-line—converting these time differences in cardiac cycle time to a rate by making the displacement of the pen linear with respect to rate.

Now, then, it turns out as a consequence of some simple mathematics that it makes a difference whether you display in terms of period or rate.

Displaying in terms of rate takes this law of initial value into account, so to speak.

Let me give you a simple example. I was warned this would come up sometime, so I jotted down a little arithmetic last night. Let us suppose we have a cardiotachometer, an instrument which translates cardiac cycle time into a display. Let us suppose we have a cardiotachometer which is linear with respect to rate. By "linear with respect to rate," I mean the following: If between one heart contraction and another heart contraction one and a half seconds were to elapse—you might find this in a young athlete at rest, for example—this would correspond to make 40 beats per minute. We can cause our machine to trace a line down at the bottom of the graph, 80 beats per minute at the middle of the graph, and 120 beats per minute at the top of the graph. Each cycle time, each cardiac cycle time appears as a line somewhere in the up-down extent of the graph. So, if at one point his heart is beating 40 beats a minute, we would have a line down here. If the next cardiac cycle time is the equivalent of 60 beats per minute,

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the graph will rise and we will have a line there. If it is next 80 beats, the graph will rise and we will have a line here.

Let us simultaneously have another tracing linear with respect to period, that is cardiac cycle time, itself. At 40 beats per minute, the heart is beating once every one and a half seconds. At 80 beats per minute, the heart is beating every three-quarters of a second: I will have to use the number 750 milliseconds, 750 thousandths of a second. At 120 beats per minute, the heart is beating twice a second or a cycle time of 500 milliseconds. Now, we will have a trace linear with respect to period. In other words, instead of displaying rates from 40 to 120 beats per minute, we will display times from 1½ second to 500 milliseconds. Now, let us consider an individual whose heart rate changes from 90 to 100 beats per minute and, of course, in an interrogation let us say. On the tracing with respect to rate this would represent a variation of 12½ percent of full scale simply because we are linear with respect to rate.

On the tracing linear with respect to period, we would have a change of only 6.7 percent full scale. This is a direct mathematical consequence of the imposition of the reciprocal relationship: heart rate and heart period are reciprocally related.

Similarly, if an individual increased in beats per minute from 80 to 100, this would represent a 25-percent variation of full scale on the trace. That full change from 80 to 100 beats per minute is a change of cardiac cycle time from 750 to 600 milliseconds. That is a change of 150 milliseconds in a trace with a spread of a thousand milliseconds. So that same response display period only occupies 15 percent of the tracing.

In this case, we go from 15 to 25 percent full scale. To me, it is obvious, then, that the choice of the method of display can influence what your eye sees.

What is not so obvious, and would require even some more arithmetic to demonstrate is, that if you display in terms of beats per minute, what is visually presented to you is more in accord with the so-called law of initial value. If the heart is beating very fast, the intercycle time is very small, very short. Therefore, a small change in rate will not be displayed very much in the tracing of periods. With the law of initial value, a very small change in period wants to be looked at as a big response.

Going from 120 to 124 beats per minute may, for this individual, at that level of function, be very great. Going from 120 to 124 beats per minute would be only a little bit of displacement where we trace period.

At that level, when we are dealing with those numbers, that little change in period becomes a very big change in rate. So, a cardiotachometer calibrated in terms of rate where each cardiac cycle is translated into its reciprocal beats per minute will give you a visual picture more in accord with the law of initial values.

Mr. KASS. So if I were to run around the block four or five times—especially running around the CIA building four or five times—my heart would be beating very fast. Presumably even though I were lying, it would not be noticeable to the naked eye at the point where the increase rose?

Dr. LACEY. Yes, that is correct.

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Mr. KASS. These are the types of procedures and qualifications and limitations you would place on the use of the polygraph in the Federal Government.

Dr. LACEY. Yes—technical. My feeling is that the ethical ones far outweigh the technical ones. We can solve these technical ones.

Mr. KASS. We could, but are these technical problems solved today in the Federal Government using the commercial polygraphs?

Dr. LACY. No, not on this display.

Mr. KASS. Since the Federal Government does purchase its polygraphs commercially, I assume that this chart and this polygraph is the same as that used in the Federal Government. So you would say the technique is not solved today in the Federal Government, these problems do exist?

Dr. LACEY. I don't know what machines are that they use.

Mr. KASS. On the assumption it is the same as this one.

Dr. LACEY. On the assumption it is the same as this, they do not take advantage——

Mr. KASS. Dr. Dearman, do you know what instrument was used in that examination?

Dr. DEARMAN. No, I don't. I would assume that it was made by Keeler in Chicago.

Mr. KASS. But you don't know?

Dr. DEARMAN. This is a book that the operator sent me, so that I could learn something about the polygraph.

Mr. KASS. But you don't know?

Dr. DEARMAN. I don't.

Mr. KASS. Dr. Kubis, could we get back to the question I asked you earlier?

Dr. KUBIS. In terms of looking at question 6?

Mr. KASS. That is correct.

Dr. KUBIS. I would agree that the response that measures the changes in the cardiovascular system here is a large response in comparison with other responses in the same record.

I would agree, too, that the galvanic skin response here is relatively nonsignificant. I can't discern any change in it that I would call large or deviant, large in the sense that they connote changes in the skin reactivity of the individual.

Mr. KASS. It is not what you would call positive?

Dr. KUBIS. That is right. I would not call this positive.

With regard to respiration, I would agree with Dr. Lacey that this type of response to question 6 occurs elsewhere in the record but in line with the techniques that are illustrated by Lee in his textbook and Inbau and Reid, this is the first instance where we get a diminution in the respiration size, the amplitude; so the operator may have used this as a clue.

It is fairly obvious this should be repeated later and determined whether it is a consistent reaction.

Mr. KASS. Dr. Kubis, could we continue on those questions, then, with the next number. What is the next question number on there? (See exhibit 20, p. 402.)

Dr. KUBIS. Seven.

Mr. KASS. Is there a positive response on GSR?

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Dr. KUBIS. I would have to know the calibration on this and see what the natural perturbation of the system is. There seems to be a small response here. That might be before 7.

Mr. KASS. The next question is question No. 40?

Dr. KUBIS. That is question No. 7.

Mr. KASS. But the next question after that, is that No. 40? The next question circled?

Dr. LACEY. Fourteen. There are other things circled. But 14 is totally circled.

Mr. KASS. What would you read the GSR to be there?

Dr. KUBIS. I would read this negative or nonsignificant.

Mr. KASS. What other questions are there that you think would have a nonsignificant GSR?

Dr. KUBIS. It may be easier to pick out those that are significant.

Mr. KASS. OK, sir.

Dr. KUBIS. I don't know what this question is, it is 7, 8, in comparison to the rest of the tracing. We are in difficulty here because there are lots of numbers, 12, 7, and 4.

Mr. KASS. You say before 11?

Dr. Kubis, let me ask one other question, though. Is it not also possible that these responses were created not because of the questions asked but because the individual examiner was a female and the individual subject was a male? Is this also possible?

Dr. KUBIS. I could be facetious and say that it depends on the question that is asked of a male by a female.

Mr. KASS. I am talking about the GSR response.

Dr. KUBIS. Yes.

Mr. KASS. Based on the studies that Dr. Lacey has done and you have done, isn't it possible that the mere presence——

Dr. KUBIS. We would have to be careful about that. If this was a female examiner, we should expect this influence throughout the record. It should not occur at specific points unless we can identify those points and the questions at those points. Therefore, we have to assume the influence of femininity throughout the examination, since a female person is present throughout the examination. We cannot say and pick out one spot and say this is due to a female examiner and this other spot which is not large is not due to the female examiner.

Mr. KASS. Couldn't certain questions that were asked, however, stimulate greater responses?

Dr. KUBIS. Yes. It depends on the meaning that the individual attributed to those questions and the implications of those questions.

Mr. KASS. Would not the examiner also have to know what meaning was derived by the individual?

Dr. KUBIS. Yes, and the examiner would have to phrase her questions so as to be objectively and directly relevant to the issues under investigation. These should be spoken in a voice that is relatively indifferent to the femininity that that examiner exerts on any of these questions.

Mr. KASS. If the question asked by the examiner was "Have you ever stolen from the bank's customers?" would that have been a better question to ask?

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Dr. KUBIS. Have you ever stolen any money from the bank's customers?

Mr. KASS. From the bank's customers. Strike the word "money."

Dr. KUBIS. Have you ever stolen from the bank's customers?

Yes, it could have been a better question because it would have implied stealing. It would have implied stealing from a specific subclass.

Mr. KASS. What about the word "customers"?

Dr. KUBIS. I would presume that those would be the people who would be coming to the bank.

Mr. KASS. You would presume this?

Dr. KUBIS. That is right.

Mr. KASS. So perhaps would the examiner, but can we presume that?

Dr. KUBIS. I think this is the ordinary interpretation that is given to this term.

Mr. KASS. But is it also possible that the subject had another interpretation of the word "customers"?

Dr. KUBIS. Yes, and we should always be on the alert for such individuals. This individual apparently was very disturbed because I cannot see how an innocent individual, an executive of a bank, presumably intelligent, presumably having many dealings with ordinary people, and seeming to have been functioning well up to that point, going to the extreme of admitting that he had done something which he had never done.

This is a difficult thing for me to accept, for any normal individual to accept, that a man who has not taken money would admit taking it. In the admission, and I cannot interpret it in any other way, he would have said it was money from the bank's customers, I think he would have meant that if they were the customers who were coming to the bank.

Mr. KASS. Dr. Kubis, what would happen at that particular point if the bank vice president really was not concerned because he had had some assurances from his president that he believes him. At that particular point he looks at the examiner who is asking the question and says to himself: She is a very attractive young woman, I would like to take her out for a drink tonight."

Dr. KUBIS. I don't think he would do that under these circumstances. The question about stealing is a threatening question. And the fact that he later admitted this type of action would not indicate that this would gain for him the access to the young lady in question.

It is very difficult psychologically to interpret his reactions and to understand him from the point of view of the normality that we would expect in respectable, efficient individuals who are operating at an executive level.

Mr. KASS. Now we are assuming executive level. The vice president of the bank, I believe, was 27 years old. I don't know what significance you can attach to that. I know I am 27 years old and I have had some thoughts in this hearing room today that would probably evoke great GSR's despite the fact that I am sitting here trying to get certain information about the use of polygraphs in the Federal Government. Is it not also possible that this bank vice president, whether 27, 47, 67, had extraneous thoughts?

Dr. KUBIS. Yes.

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Mr. KASS. Or exciting imagery, as I think you called them in your study?

Dr. KUBIS. Yes. We have to postulate highly improbable situations, then. If I understand the meaning or the implication of your question, then these highly exciting thoughts would have come up only in one class of questions and not in the other class of questions. I would presume that if these were highly exciting thoughts and if they were not specifically related to the question, that they should also occur in questions that have nothing to do with taking of the money from the bank. They should occur under these circumstances, in these other questions.

Mr. KASS. If the subject in this particular case in his own mind, twisted as it may be—I don't know—assumed or brought the examiner, who happened to be a female, into his mind as his mother or his wife, and every time he used the word "customer," he associated it—and I assume these associations can be rapid—with customer, with his wife, could you not have a constant at that particular question which would evoke great GSR's only at that particular point?

Dr. KUBIS. With regard to customers?

Mr. KASS. With regard to customers.

Dr. KUBIS. Yes; he could have done that. That is why I say the question originally as formulated was a poor one.

Mr. KASS. But we did agree earlier that even the question that would have been a better question asked, "Have you ever stolen from customers," that even this question could have caused serious problems.

Dr. KUBIS. Yes; in a disturbed individual, but in ordinary circumstances, these individuals are not so numerous.

Mr. KASS. Are you saying that most individuals are not normally disturbed? I have been reading that all of us have a few neurotic tendencies.

Dr. KUBIS. I say that most individuals are not disturbed in the sense of pathology.

Mr. KASS. Is this a pathological disorder or a neurotic disorder or just being a red-blooded individual?

Dr. KUBIS. Who would admit to having done something which he didn't do? A red-blooded individual?

Dr. DEARMAN. That he admitted to having done something he didn't do, but in his own unconscious mind he had felt he had done to the customers of the bank; namely, wife and mother.

Mr. KASS. Is this possible?

Dr. KUBIS. This is an inference which Dr. Dearman has made. I have not studied the case and I cannot make such an inference. In a hypothetical case, if you gave me full details and all the relevant information I would have to agree with certain types of conclusions under certain circumstances.

Mr. KASS. Dr. Kubis, this is one inference that is made by Dr. Dearman. You have made another inference or you could make another inference, based on reading the case. Would you come to a conclusion immediately that specific reaction indicative of deception is present?

Dr. KUBIS. Not when I know that he says that he stole money and he didn't. I would say this is a disturbed individual. I don't know what is in the mind of a disturbed individual because by definition a

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disturbed individual has certain types of disturbances which are hard to interpret.

I should like to point out that this is an exceedingly unusual case where the man admits something that he didn't do.

Dr. DEARMAN. May I say this. He says I inferred. Let us look at it a little bit. What is the scientific method, and if I am wrong, correct me. A man observes a phenomenon and he wonders about it, why would this thing happen? He has seen the thing happen but he still can't figure out why. So, he says, all right, let us do it again under the same conditions as nearly as we can duplicate them, and let us make us a hypothesis that if such and such things are done, this will follow. This is the hypothesis I made.

Would you call that an inference?

Dr. KUBIS. Because you have access to information in your psychiatric work, which we haven't and which could not be obtained until——

Dr. DEARMAN. As you know it, would you call that inference? If you set up an experiment, you made a hypothesis, and you proved the hypothesis, is this inference?

Dr. KUBIS. Let us say if your hypothesis is a legitimate hypothesis, you have shown that your hypothesis has been verified by the experiment, provided everything else there is legitimate and well controlled.

Dr. DEARMAN. Sure.

Mr. KASS. Dr. Kubis, without the psychiatric examination, without the background investigation, without all the other information needed to make a determination, could you or would you recommend making a determination of guilt or innocence or truthfulness or falsity?

Dr. KUBIS. In what situations?

Mr. KASS. In this particular case.

Dr. KUBIS. I would have to know the situation, I would have to examine the case; I would have to know under what circumstances it was done; I would have to know something about his reactions.

Mr. KASS. Would you recommend to the bank president at that particular moment that this man is perhaps "rotten"?

Dr. KUBIS. Of course not. I would just say that he gives large cardiovascular responses. He is apparently cardiovascularly disturbed at certain points where certain questions have been asked.

Mr. KASS. You made one other point, that people don't normally confess.

Dr. KUBIS. If they have not done it.

Mr. KASS. If they have not done it. Could you document this?

Dr. KUBIS. I think I could ask any one in the room, that this is a phenomenon that all of us observe in life.

Dr. DEARMAN. That people don't confess at times to things that they don't do?

Mr. KASS. How many people go into a police station after a crime has been committed and for various reasons say, "I did it."

Dr. KUBIS. I would like to know the figures.

Mr. KASS. But you don't know the figures?

Dr. KUBIS. That is right.

Mr. KASS. So you can't say as a matter of fact that people don't normally run and confess if they don't do something.

Dr. KUBIS. I think newspapers like to report these things.

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The incidence of such instances is relatively small.

Mr. KASS. Based on——

Dr. KUBIS. What I have read in the newspapers; yes. Now, if we have access to other information, I certainly would like to know that as anybody else would. There are such people, there is no doubt about it.

Mr. KASS. Dr. Kubis, what other means are there of beating the instrument or beating the examiner or beating the operation or technique. How do you beat the lie detector?

Dr. KUBIS. There is an inveterate tendency in individuals to protect themselves against threat. The individual tries to avoid threat in various ways and in the case of the threat of being found out as a culprit, a number of individuals that I have examined have thought about ways of fooling the lie detector examiner. They want to avoid being discovered. So they utilize several types of procedures. I think there are, in general, two types of procedures. Either they flood the record, that is, fill up the record with irrelevant reactions so that there are many large reactions. This makes it difficult to compare the response to the significant question, such as: Did you kill John Jones, with the others? Technically, a lot of "noise" is put into the system. Another method of defending oneself is getting the examiner on the wrong track, by trying to elicit responses that are large to questions other than the important question. These are the two basic approaches to the problem of evading detection.

Mr. KASS. Are either of them possible?

Dr. KUBIS. Yes, they are possible. In point of fact, if the individual squirms too much, I don't think you can get valid records. So it would be a very simple procedure for an individual to say that he wants to cooperate but still move a lot and exasperate the operator by such movements which would be reflected throughout the record.

Mr. KASS. Now, there is a difference between much movement or trying to get too many things on the chart where the examiner would say, you are trying to beat me, you had better sit down and be quiet.

Dr. KUBIS. The person would say, "I am very nervous." You have no defense against this.

Mr. KASS. Then is it possible for the examiner to come up with the wrong conclusion?

Dr. KUBIS. If he is a good examiner, he should not examine that individual.

Mr. KASS. Is it possible to beat even a good examiner through other means?

Dr. KUBIS. Yes, I think it is.

Mr. KASS. How?

Dr. KUBIS. There are types of procedures that should be studied by all people interested in lie detection so that individuals can be detected if they deliberately use them. Whenever they legitimately occur, these sources of disturbance and, therefore, sources of error, should be eliminated.

One procedure which is classic, and, which I am sure every one has thought about, is to induce excitement in oneself at points other than the significant questions. This excitement is manifested in the record and would introduce "noise" or extra reactions in a part of the record where the examiner does not expect it. At the least, this will cause doubt in the mind of a good examiner, for he would be off the

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main track in trying to explain these large reactions. Therefore, the person being interrogated would have a good chance of eluding the examiner because he has forced him into side alleys.

It is very expensive from the point of view of time to check out these other large reactions which seem to indiciate quite a bit of disturbance. As to how often this technique is used, I would surmise that the ordinary first offender, in the excitement of being examined, cannot mobilize either his energy or his thinking, to very adept at this. Consequently I would expect that most of the individuals who are being examined do not use this procedure in a systematic way.

Mr. KASS. But can a person who, to use your own words, is adept and is not ordinary, can a person—not induce responses at other points to fool the examiner but—suppress his response at the question so that it would appear that there is no deviation from the so-called norm?

Dr. KUBIS. This is very difficult because the task that the individual gives to himself, of suppression, gets him into a heightened state of reactivity. When the critical question is asked, he may say to himself, "I have to suppress," and this puts him in an alerted condition, and probably elicits more tension than it should. He might even evoke a large reaction. This is a dangerous procedure. I would not recommend it.

Mr. KASS. Is that Dr. Orne's theory, that the more you try to deceive the more you are caught?

Dr. KUBIS. This is partly verified by an experiment that I had done. If evolved by the use of the "Yoga" technique where the individual tries to be as calm as possible and tries to suppress his reactions. What happens is that he gets to a much lower level of general responsivity throughout the record and when these other disturbing questions come in, even a small response looks flagrantly large in comparison to the suppression he has been able to achieve elsewhere.

Mr. KASS. What about the classic case, mentioned in Mr. Inbau's and Mr. Reid's book, when the question was asked: "Did You Kill Mabel?" the suspect—who it was later verified did in fact kill Mabel, was thinking of another Mabel and he said, "No, I did not kill Mabel," and there was in fact no deviation from this norm.

Dr. KUBIS. This, again, is a difficult procedure. If he has done it, I have to give him credit for it.

Mr. KASS. It is possible?

Dr. KUBIS. If it has occurred, then I guess it is possible.

Mr. KASS. Dr. Lacey, you have done some work in suppression of behavioral characteristics, if this is the scientific term to use. Is it possible to suppress your physiologic response?

Dr. LACEY. A few years back, I got interested in what was known as Yogi.

Mr. KASS. Yogi, or Yoga?

Dr. LACEY. Choose your own form, Mr. Kass. I don't know. Actually, an eminent psychophysiologist, Dr. Wenger, of the University of California at Los Angeles, and Dr. Bagchi from the University of Michigan, went on a scientific expedition to India to study Yogi on the spot. The question of expenses and transportability did not bother them. I also was interested in it. They were doing field investigations to determine whether in fact this kind of thing did exist.

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You are all familiar with the reports of suspended animation, cessation of cardiac activity and whatnot.

About the same time I started a series of investigations in the laboratory to see if I could just begin to reproduce in the laboratory any sort of control. I could not in the laboratory. That, however, is a statement you will have to take with a very large grain of salt. I did not make a very intensive effort and there are a lot of secrets we don't understand.

Yoga or Yogi is probably the best or most extensive evidence we have that even raises the presumption of rather successful dramatic suppression of ongoing autonomic activity.

I have to be really responsible for this conclusion, I just am not sure. Certainly, the evidence was unimpressive that it did in fact exist in India.

I think Dr. Wenger's conclusion was that all instances that he was able to observe were due to control of respiration, which, of course, we can all do. This was not a direct suppression of autonomic activity.

Let me state that they had great difficulty in locating true advanced Yoga. In other words, if it does exist, it exists in only a few highly trained individuals who have some physiological secrets that we in the West certainly do not have. Even there, there are only a few individuals and they are hard to locate. I would say within all practical limits, there are no known techniques for the widespread dramatic suppression of autonomic activity that we are talking about there. Whether suppression of this sort could occur in this kind of lie detection, I don't know. However, there are more subtle things involved, more subtle than voluntary suppression.

There are some reports in the literature which raise some very interesting hypotheses capable of testing, that the nature of the interaction, social interaction, between the examiner and the examinee has some effect on the channel of somatization, that is, whether one should be looking at blood pressure, skin resistance, or blood flow perhaps which are never included on these records. I refer to what we call in our field, situational stereotypy, stimulus specificity. Perhaps the most relevant study is a study by Dr. Reiser and his colleagues. Dr. Reiser is now professor of psychiatry at Albert Einstein Medical School in New York. These studies were done by him at the time he was a captain in the Medical Corps. He was studying the effect of interview techniques on cardiovascular physiology.

In one case, he, Dr. Reiser, personally took the blood pressures. The individual also was being measured on a ballist cardiograph, which is a record of the ballistic recoil movements of the body as blood is expelled forcibly into the arterial tree.

In another instance—I can't remember whether it was a sergeant or a private—a technician of lower rank took the blood pressures while the ballist cardiograph was also being taken. Now, then, the content of the interview, the formal interview, I think, was about the same, but obviously the informal interaction surrounding the interview was very different when a private or a sergeant examined the soldiers than when a captain of the Medical Corps examined the soldiers. For example, griping, very common in the Army, was quite freely done when the private was around. A more formal, much more pleasant,

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nongriping atmosphere was generated when the captain took the blood pressures.

The interesting thing was that if one wanted to detect physiological changes consequent upon the symbolic stimuli in the interview situation, one would have chosen different physiologic measures to look at, depending on whether the captain or the private was doing the measuring.

I don't remember which way it went, which is simply another way of stating that theory in this field is still very primitive. We are all hard at work trying to arrive at generalizations that make sense. When I say to you I don't remember which way it went, I am simply admitting I have no general principles, I would have to remember this little detail. But it might have gone something like this, trying to think about general principles—I will be interested to check myself later—that in the presence of the captain, the measured blood pressure response did reveal differential impact in the interview material on the soldier being examined but the ballist cardiograph record did not.

In the presence of the private, the blood pressure response did not reveal any differential impact in the interview, whereas the ballistocardiogram record did.

The important principle is that the nature of the surrounding socialization may determine, by mechanisms we do not yet understand, that suppression of differential physiologic perturbation to symbolic stimuli will automatically occur and that one has to look elsewhere to another somatic channel which you see may not even be represented on here.

Mr. KASS. That was a study in "Psychosomatic Medicine" by Reiser?

Dr. LACEY. Yes.

Mr. KASS. Volume 17, 1955, "Psychosomatic Medicine," page 185.

Dr. LACEY. And other examples like that. That happens to be my favorite study in this area.

Mr. KASS. Dr. Lacey, I have just one further question. We have taken testimony from some of the witnesses earlier in the private usage of polygraph who stated that in the actual fieldwork, contrary to the very fine studies that you and other physiologists have done, GSR is not too good. We have taken testimony today from you that blood pressure and pulse, sometimes, is very difficult to read.

Dr. LACEY. The heart rate, yes.

Mr. KASS. The heart rate. We have also heard from you that it is possible to suppress automatically or voluntarily, whatever it may be, your respiration. What else is left of the component parts of the polygraph?

Dr. LACEY. I don't get the sense of your question.

Mr. KASS. I see three parts to the polygraph. There is the GSR, the galvanic skin——

Dr. LACEY. I understand what you mean. You say, now that doubt has been cast about every channel in the polygraph, what can we make of it? I think an honest and truthful answer to that, Mr. Kass, would involve a statement something like the following.

If polygraph examinations are to continue—and I have already stated over and over that I hope they continue only in very limited ways and controlled ways and regulated ways, and only when there are real vital issues at stake—if they are to continue, I as a student of these

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matters would like to see the technique improved. I think there are many directions in which they can be improved. All these errors, if you will, all these questions, including Dr. Dearman's case, simply are crossing the t's and dotting the i's and putting an exclamation point over the fundamental concept that we must employ whenever you are dealing with a test situation of any kind; namely, that there is no perfect test available in any field. We have all emphasized this over and over and over again; this technique, too, has to be of imperfect validity. Anybody who makes claims to the contrary has to produce the evidence for me. I do not mind saying, as a matter of fact I want to say, that some of the newspaper reports of the field adequacy of this technique strike me as ridiculous. The Dayton police chief, in answer to some publicity about the Moss committee, snorted in public and said in his hands it is 98 percent reliable. I cannot believe it. I just cannot believe it. If it is, he is a lot better man than I am.

These errors which we emphasized are simply the sources of the false positives and the false negative which, as we have mentioned over and over and over again, exist. The techniques of the so-called lie-detection procedure, as I have read it and as I have understood it, are, in my opinion, I repeat again, partial protection against this kind of error. Now I say "partial." I think any responsible polygrapher—if that is the term to use—would have to admit that these are only partial protections. I think there are things that we can do about them. That is to say—I hope I don't have to but I might someday become involved in this fearsome venture—I think there are things we can do to upgrade the technique on the technical side. I think some good sociologists and lawyers working together could do something to improve interrogation procedures.

In other words, where the national security requires, if indeed it does, and I make no prejudgment on this issue—where the vital national security, which is the only place I am willing to use this technique, requires that the polygraph examination be used, I would like to see it researched, improved, so that the number of false positives and false negatives are decreased as much as possible. I do not desire to throw out of the picture a potentially valuable adjunct—adjunctive only—adjunctive technique for the gathering of information where it is required.

So, Mr. Kass, in answer to your question, a great deal is left even in such—from the laboratory point of view—even in such a printed record as this.

Mr. KASS. Thank you, Dr. Lacey. I have no further questions.

Mr. MOSS. First, I would like to ask both Dr. Lacey and Dr. Kubis if they will comment on the article read earlier by Dr. Dearman, written by an official of the Virginia State Police, where he strongly emphasized the importance of convincing the examiner of the infallibility of the polygraph. Would either of you relate this to proper procedure?

Dr. LACEY. I think I have already answered that partially when I said I think—well, it is a lie, it is a deception of the public. I feel very strongly this should not be done. I stated that if the public were properly informed this might decrease the validity of the lie-detection procedure.

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My answer to that is, too bad, but that is what the democratic ethic requires. I don't want to live in a police state. It is not an infallible technique. When one says it is, one is using a club.

Mr. Moss. On the contrary, it is a relatively fallible technique?

Dr. LACEY. It is a fallible technique; yes, sir.

Mr. Moss. Dr. Kubis?

Dr. KUBIS. Yes, I would agree. We would not use lies either to intimidate people, or to appear as if we are very truthful individuals. Deception ultimately will destroy the individual who uses it. In time he will become worse as an examiner, because as he comes to believe his infallibility he gets closer and closer to the position of God; and when one does get that close, he does not belong with us mortals. He belongs elsewhere. This procedure is to be condemned and should not be utilized.

Mr. Moss. Now, very briefly, what happens if we have a person of average or less intelligence—perhaps a very meager education—who is convinced by one of these examiners that this machine is infallible. It is going to find out rather quickly whether he is lying or telling the truth; and he responds truthfully to the best of his ability, and the operator says he is lying? What happens to the individual at that point? Does he then start to try to defend himself, to beat it by whatever means might be available? Does he become confused? What actually happens to that individual? How will it affect him?

Dr. KUBIS. I don't think many individuals believe this, if they have to answer this question outside of the interrogation. They might in the height of the emotional confusion that exists at that time. But I would suspect that such an individual, if he is innocent, will claim that he is innocent and will not admit to the situation. But at the same time he may be fearful of the consequences of such a decision which may be put into his record. I have heard at a meeting of polygraph operators one representative who gave a speech saying that "I don't even look at the record; I accuse him of it, and then study his reaction." These are techniques that some people may use to try to elicit confessions, but my point on this is that if you use such tactics why use a machine. Accuse him immediately of the crime, and if the individual has actually committed the crime, and if he is susceptible to such types of pressures, he may confess.

This is a technique that sometimes a number of interrogators might like to use. I don't know how frequently it is used in actual interrogation.

Mr. Moss. You indicate you feel it would be rather infrequent that a person would actually believe the machine was infallible. Yet I have read within the past week in connection with a campaign for high public office in one of the States of this Union where one of the principle candidates has challenged the other to take a lie detector test which, at best, would be nonconclusive.

Dr. KUBIS. Yes.

Mr. Moss. Now is he hippodroming, or does he believe it? I grant that he believes they are relatively infallible instruments.

Dr. KUBIS. I wonder whether he is just trying to bring up an issue that may be completely irrelevant to the campaign.

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Mr. Moss. That has been known to happen. My ready response to such a challenge would be very polite, but I have not read the response in the case I have in mind.

Dr. KUBIS. Certainly it is an inappropriate, uncivil procedure to use.

Mr. Moss. We read frequently in much of the press and news media of the country where there is almost a public attitude of scorn because someone has declined. One of the reasons this committee is operating is because a Member of Congress, Representative Gallagher, became indignant over the urgings by high officials of the Pentagon that high officials in the civilian branch of the Government take such a test. I think it is to their credit they did not.

However, again that is one of the things that somebody must believe these are relatively infallible.

Dr. KUBIS. I wonder whether it might also be used as an instrument of intimidation, which would place the individual taking the test in jeopardy and also would incriminate him of some type of action of which he was completely innocent. A technique such as this would tend to smear his reputation thereafter, because there will always be individuals who are ready to believe that he could have done it.

It may be for the purpose of creating a doubt in the mind of others about the honesty of this man. This could be very effective, because if the procedure created a doubt in the mind of individuals, he may have gained his point.

Mr. Moss. I think motivation here is difficult to establish.

Dr. LACEY. It would be an inference.

Mr. Moss. Mr. Reid.

Mr. REID. Thank you, Mr. Chairman.

I just have three brief questions: First, Dr. Kubis, I believe in your earlier testimony you started to talk about training and the need for training in three areas: technical operation of the polygraph; the procedures involved in interrogation; and finally the interpreting. Could you, as precisely as possible, give a reasonable estimate as to the length of time that should be allocated in any course for some kind of professional standards to be developed in those three areas?

Dr. KUBIS. Yes, Mr. Reid.

I am an extremist on this issue.

Mr. REID. I wish you would be extreme in this sense, that you err on the side of full protection to the individual and full training professionally on behalf of the operator, interrogator, and/or interpreter.

Dr. KUBIS. Yes. Many people disagree with me; probably violently, too. I should like an operator or examiner in this field which involves the manipulation and control of the delicate, interpersonal relationships and an evaluation of an individual's on-going mental condition, to be a student of psychology; to have taken specialized courses in psychology. And I should like him to have at least a master's degree in psychology, with specialization in instrumentation, in interrogation, interviewing, and personal dynamics.

As for the people who are doing extremely important work, I should like them to have the training of a doctorate student, although not necessarily the degree.

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Mr. REID. Could I ask this supplementary question: If you had an individual with a college education or with a master's degree but who, perhaps, had not had any specialized training in the area we are talking about, how much additional training—and this, I think, we are faced with in the use of polygraph in the Federal Government—specifically, would you allocate to learning the operation of the machine; to interrogation; and to interpreting? I assume you have some reasonable level of maturity in college education, perhaps graduate study, but no familiarity at that point with the machine, with interpreting, or with interrogating.

Dr. KUBIS. He has not taken any special course work?

Mr. REID. No.

Dr. KUBIS. He is already an operator?

Mr. REID. No.

Dr. KUBIS. He is not an operator?

Mr. REID. You have a college graduate with a master's degree. You are setting up appropriate standards for consideration in the Federal Government in the three disciplines you have just mentioned. You originally said, as I understand it, that on technical operating procedures you perhaps needed up to 6 months.

Dr. KUBIS. Yes.

Mr. REID. Could you give me some such scale that is roughly relevant for each of the three you are talking about? I assume it is ideal to have an overall background and a master's degree, preferably, psychological training, perhaps knowledge of psychiatry; but the services take a certain number of men, and they put them through a course. Could you give just a rough rule-of-thumb that would err on the side of high standards?

Dr. KUBIS. The man who is in serious interrogative work?

Mr. REID. You just decided as a secretary of one of the departments that you are going to have 10 people involved in the use of the polygraph. You have gotten a relatively high educational background. You are going to set up a course on knowledge of the polygraph operation, interrogation, and on interpreting.

Dr. KUBIS. I would say, and again I am extreme—an additional 2 years of training. This may mean internship with a man who has already attained good standards. This could be done by internship where he could get experience by actually working.

Mr. REID. But before he would be solely responsible for giving a test, interrogating and interpreting, it would be at least 2 years?

Dr. KUBIS. I would say 2 years. Again, I am an extremist.

Mr. REID. Thank you.

Dr. Lacey, I believe in your testimony you talked about the need for some legal controls to protect the rights of the individual. Would you be good enough to spell out a little more precisely what you have in mind?

Dr. LACEY. If you promise me not to attack me for practicing law.

Mr. REID. No; I think we are all individual citizens of the country concerned with the broad question of the rights of individuals.

Dr. LACEY. In all seriousness, Mr. Reid, I don't know. That is because I simply have not been involved in the practical matters involved. So, I can answer your question only in the most general of terms. If that is satisfactory, I will be glad to do so.

Mr. REID. Certainly.

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Dr. LACEY. When you were out of the room, I think I said that the adjudication—no, let me start all over again. The view I expressed yesterday was that the only use of the lie detector which I would feel comfortable about, was one where one was trying to select or classify or arrive at some administrative-legal decision about one subject sample of individuals from a very large subject sample of individuals. I can show mathematically that there would be no argument, no value judgment involved. One can show mathematically that with stated degrees of validity one will get stated degrees of precision of selecting this subject from a sample of individuals.

Under these circumstances, I would feel that there should be really a board. Certainly the law must be represented on the board. Certainly a psychologist or a psychiatrist must be represented on the board, perhaps both. They really have different skills. The examiner should have full power to challenge an inquiry and ask nasty questions, "How in the devil do you know that?" Perhaps, although I rather doubt it, somebody who knows something about psychophysiology. I will agree with what Dr. Orne said yesterday, if you provide good instrumentation that is about it; you diminish the demand on the technical side. Somehow the adjudication of the attribute that you are going to assign to this man should be just that, an adjudication process.

Mr. REID. To take one or two specifics: One, you would hold that the individual would have the right not to take this test, and further, that the fact that he did not take it would be considered without prejudice? That would be one legal protection?

Dr. LACEY. Yes.

Mr. REID. Second, I would assume that you would agree that an individual who did take the test should have the right of appeal without question.

Dr. LACEY. Without question.

Mr. REID. In some concept of due process that would reflect perhaps the kind of board you are talking about.

Dr. LACEY. Without question.

Mr. REID. Thank you. I have one other question, Dr. Lacey. I believe that you have done some work as a part of a group with the Research and Engineering Support Division, Institute for Defense Analysis, with regard to the objective measurement of autonomic responses for use in lie detection. As part of that study I believe at one point——

Dr. LACEY. I don't know, isn't this classified?

Mr. REID. This is not now classified. This has been declassified. All I wanted to place in the record, with whatever comment you might want to make, is that at one such meeting in July 1961 there were eight areas of suggested study that you thought would be pertinent.

Dr. LACEY. Not individually. There was a group of psychophysiologists at that conference.

Mr. REID. I take it that would still be your view, that those studies should be carried out.

Dr. LACEY. I don't remember what the eight areas were.

Mr. REID. I understand that, but in general you subscribe, I take it, to the views of that committee with regard to additional study, and there are a list of eight.

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Dr. LACEY. Perhaps with one exception, Mr. Reid, one qualification; that I think I came away from that conference feeling that my colleagues were a bit more optimistic about the potential success of this technique than I was. That is the only qualification I made. As a member of the group advising IDA, I was in agreement with the general tenor of the report. Certainly it says there is lots of research that needs to be done.

Mr. REID. Mr. Chairman, I would like to ask unanimous consent that this list of possible areas of study be included in the hearing and any other sections of the report counsel feels may be relevant.

Mr. MOSS. Without objection, it may be included in the record. (See exhibit 24B, p. 421.)

Mr. REID. My final question is the simple one of the overall validity of the lie detector. I think we have heard a lot of testimony from those who are sophisticated in its use, such as psychologists and members of the law. I think you have said that you do not favor its use in the Federal Government. Is that a flat statement, or do you feel that it could be used in certain instances?

Dr. DEARMAN. I was in agreement with Dr. Lacey yesterday that if you have these 1,000 men and you need 10, you know some of them are going to show false positives and false negatives, but you want to get as good 10 men as you can get; but of the other 990, all those records be burned, nothing is left, expunged from the record. In other words, there is nothing to show that these men had ever had anything. I would agree with that.

Mr. REID. Could we have a concensus of you, Dr. Dearman, Dr. Kubis, and Dr. Lacey just what you think the use of a lie detector is? As I understand it—and I will try to paraphrase what I think you have all said in substance—you would only use it in cases of serious national security, and not under any circumstances for trivial purposes or trivial inquiry.

Dr. DEARMAN. I would only use it in connection with other psychological examination.

Mr. REID. I would like to narrow it. Do you want to see widespread use of the lie detector in the Federal Government throughout the depths of the Government, or do you wish to narrow it to serious matters of national security?

Dr. DEARMAN. I would say serious matters of national security, but I would want, as Dr. Lacey said yesterday, that this would be just one part of it. I want the other psychological tests that went along with it.

Mr. REID. I understand that, and a series of safeguards. But in general are all three of you agreed that widespread use in untrained hands should not be pursued and that its use should be limited to highly trained persons, to serious cases, and finally with full protection for the rights of the individual, legal and otherwise?

Dr. DEARMAN. With other psychological testing.

Mr. REID. And with any other psychological testing or safeguards that might be pertinent.

Dr. DEARMAN. Yes; I would agree with that.

Mr. REID. Your judgment that the present use of the lie detector as it has been developed before this subcommittee is widespread and lacks appropriate safeguards and appropriate standards?

Dr. DEARMAN. And it should not be used.

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Mr. REID. In its present form?

Dr. DEARMAN. In its present form.

Mr. REID. Is that a fair statement of your views, Dr. Lacey and Dr. Kubis?

I think it would be very helpful to sum up for this subcommittee really what the validity of this is. Should it be used and, if so, only in limited areas very carefully surrounded with protections to the individual and high professional standards. I think the public has the idea a little bit that this has had widespread use in the Federal Government and that it has some areas of potential infallibility, which the testimony of you learned gentlemen I think has clearly indicated is without thorough foundation.

Dr. KUBIS. Mr. Reid, I would agree completely with the first part of your statement, but I don't feel competent to state how widespread or inadequate such tests are in the Government. I don't feel qualified to make that statement. But the first part is a very excellent statement of what I believe, that is, the first part of your statement.

Mr. REID. Do any one of you three gentlemen wish to add anything in terms of what you think should be done now?

Dr. DEARMAN. You mean as regards the use of the polygraph as it is being used today?

Mr. REID. In the Federal Government.

Dr. DEARMAN. It should not be used today in the Federal Government like it is being used.

Mr. REID. Very good. I take it that is a statement that you would all subscribe to?

Dr. LACEY. No.

Dr. KUBIS. No. We don't know the way in which it is used in the Federal Government at the present time. It would be very prejudicial to make a statement.

Mr. REID. Dr. Lacey has some knowledge of how it is used.

Dr. DEARMAN. This document tells you a little bit about how it is being used. According to this, I would say it should not be used in the Federal Government.

Mr. REID. This is clear. Thank you, Mr. Chairman.

Mr. MOSS. Gentlemen, we are about at the end of this session. We will not resume this afternoon. I would like, if possible, to impose upon you, Dr. Kubis and Dr. Lacey, if you could conveniently at a later date suggest to the committee the type of research or evaluation which should be undertaken by the Federal Government in those areas where it continues to utilize polygraphs.

It seems to me that throughout the course of the committee work today and the hearings we have had, that it is clear that although much research goes on in the laboratory, no research goes on in the field. We seem to have evolving here almost another disclipline, perhaps taken into the field far too soon. It is thought in many areas that it is most reliable, but at no time has there been the scientific study of the results obtained, the evaluation which characterizes its use in the laboratories. If it is, in fact, a scientific instrument that we have here, then the evolution should certainly follow some evaluation pattern that would be in accord with scientific procedure.

Do you disagree that there is a lack of this kind of work in the field?

Dr. LACEY. I don't know how complete it is. I certainly know that I am not familiar with any validation figures that I would trust. I

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think I would be aware of them if these had been published in journals, widespread.

Mr. Moss. I made this same request of Dr. Orne yesterday before he left. He is going to accommodate the committee. It would be most helpful to us, because at some point we are going to have to file a report and study and consider recommendations to the Congress.

Dr. Dearman, the Chair is informed that the operator who made the tests in the second examination of your patient disagrees with your recollection of the conversations which took place following the examination. In an effort to make the record very clear, I would ask first, if you have any comment on that?

Dr. DEARMAN. You mean my recollection of what happened? I remember what happened.

Mr. Moss. Do you have no reason, then, to want to change your recollection?

Dr. DEARMAN. No, sir.

Mr. Moss. Then, would you supply for the committee a photostat of the original report signed by the operator?

Dr. DEARMAN. I will be glad to do so. (See exhibit 22, p. 410.)

Mr. Moss. So that, as that report reflects conclusions it be accurately stated on this record?

Dr. DEARMAN. Yes, sir. Let me say this, that what she put in the report is not the same as what she said that day. I would go by what the report said. This was her way of writing up the report. But I do remember what she said. Dr. Smith was there. He remembers what she said. On page 1018 of the article it states what she said.

Mr. Moss. For the purposes of the committee, it is relatively irrelevant to the committee; but just to indicate that there has been express disagreement, I would like the record to reflect the nature of the disagreement.

Dr. DEARMAN. Yes, sir.

Mr. Moss. I ask also at this point, Mr. Reid, if there is no objection, that the staff be permitted to include in the record of these hearings those documents pertinent to it or referred to in connection with the hearings. (See exhibit 25, p. 425.)

Mr. Moss. Gentlemen, I can assure you that I have had a most interesting and, I think, profitable 2 days. I wish we could continue. But the schedule of the Congress does not permit us that luxury.

I thank each of you for your appearance. I hope that we can call upon you again should it become a desirable matter for the committee.

Mr. REID. Mr. Chairman, I, too, would like to thank Dr. Lacey, Dr. Kubis, Dr. Orne who is not present, and Dr. Dearman for their thoughtful and pertinent testimony which I think has been extremely helpful on a subject that I know is complex; but I think they shed light on it, and I think we all appreciate it.

Mr. Moss. This will conclude this series of hearings. Others will be announced later as the committee develops firm planning. The subcommittee is now adjourned.

(Whereupon, at 1:25 p.m. the subcommittee adjourned subject to call of the chairman.)

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APPENDIXES

(Exhibits 1 to 18 appear in parts 1 and 2 of these hearings.)

EXHIBITS 19A–19D—BIOGRAPHICAL SKETCHES SUBMITTED BY SCIENTISTS APPEARING BEFORE THE SUBCOMMITTEE

EXHIBIT 19A—H. B. DEARMAN, M.D.

General:

H. B. Dearman, M.D. (psychiatry), 208 East Watauga Avenue, Johnson City, Tenn.; telephone 928–4517

Born, May 14, 1921, in Wingate (Perry County), Miss.

Education:

Finished high school in April 1939, New Augusta High School, New Augusta, Miss.

Received B.A. degree May 1942, University of Southern Mississippi, Hattiesburg, Miss.

Received medical certificate in February 1945, University of Mississippi, Oxford, Miss.

Received M.D. degree December 1946, University of Tennessee, Memphis, Tenn.

Internship, 1 year (January 1947–January 1948) Methodist Hospital, Memphis, Tenn.

Two and one-half years preceptorship in surgery, January 1948–July 1950.

One year preceptorship in anesthesiology, 1951–52.

Professional status:

Private practice of medicine (general practice) January 1948–July 1950, Columbia, Miss.

Private practice of medicine (general practice) August 1951–July 1959, Carthage, Miss.

Psychiatric residency, July 1959–July 1962. Chief resident, July 1961–July 1962. University of Virginia Medical Center, Charlottesville, Va.

Private practice of psychiatry, July 1962 until the present time, Johnson City, Tenn.

Military service: Navy, active duty, rank lieutenant senior grade, October 1950–August 1951, honorable discharge, 1955.

Associations:

At present, member of the American Medical Association and affiliated State and local societies, associated member of the American Psychiatric Association.

Formerly member of American Academy of General Practice and the American Society of Anesthesiologists.

EXHIBIT 19B—JOSEPH F. KUBIS

Joseph F. Kubis, 37–18 88th Street, Jackson Heights 72, N.Y.; TW 9–7057.

Birth, March 13, 1911 (Brooklyn, N.Y.; married (two children); business address, Fordham University, Bronx, N.Y.

Education:

1824–28: Bushwick High School, Brooklyn, N.Y.

1928–32: St. John's University, Brooklyn, N.Y.; B.A. degree.

1932–37: Fordham University, New York City; M.A., Ph. D., (major field: Psychology:

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Member, scientific organizations:
American Association for the Advancement of Science.
American Psychological Association.
American Society of Criminology.
American Statistical Association.
American Personnel & Guidance Association.
Biometric Society.
Mathematical Association of America.
Medical Correctional Society.
New York Academy of Sciences: Chairman, Division of Psychology.
Psychometric Society.
Sigma XI.

Consultant status:
Present:
National Aeronautics and Space Administration (Washington).
Veterans' Administration (Brooklyn).
Catholic Charities (New York).
Intermittent: City and State police authorities on criminal interrogation.
Recent:
Institute for Defense Analyses (Washington).
Office of the Director of Defense Research and Engineering (Washington).

Professional status:
Assistant and teacher, Fordham University, 1934–36.
Instructor, Fordham University Graduate School, 1936–39.
Assistant professor, Fordham University Graduate School, 1939–44.
Associate professor, Fordham University Graduate School, 1944–53.
Professor, Fordham University Graduate School, 1953–present.

Research interests: Emotional reactions, their measurement; stress and anxiety; interrogation and interviewing.

EXHIBIT 19C—JOHN I. LACEY

John I. Lacey, born April 11, 1915, Chicago, Ill. B.A., Cornell University, 1937; Ph. D., Cornell University, 1942. Chairman, department of psychophysiology-neurophysiology, Fels Research Institute, and professor of psychophysiology, 1946 to date.

Susan Linn Sage scholar in psychology, Cornell University, 1937–38. Susan Linn Sage fellow in psychology, Cornell University, 1938–39. Junior graduate assistant in psychology, Cornell University, 1939–40. Senior graduate assistant in psychology, Cornell University, 1940–41. Research associate, the Psychological Corp., New York, N.Y., 1939–42. Instructor in psychology, Queens College, N.Y., 1941–42. Induction station psychologist, 1942. Personnel consultant, the Adjutant General's Office, 1943–44 (second lieutenant, ASC). Aviation psychologist (second lieutenant to captain, Air Force), 1944–46. Lecturer in psychology, Ohio State University, 1950–59. Lecturer in psychopathology, University of Louisville, School of Medicine, 1955 to date. Member, National Psychological Research Council for the Blind of the American Foundation for the Blind, 1955–57. Commonwealth Fund postdoctoral fellow in neurophysiology, 1957–59. Consulting editor: Journal of Comparative and Physiological Psychology, 1953 to date; Psychological Review, 1958 to date; Journal of Psychomatic Medicine, 1962 to date; technical contributions, editor and consulting editor, 1962 to date. Member, mental health study section, NIMH, 1957; behavioral sciences study section, NIMH, 1958; experimental psychology study section, NIMH, 1958–60. American Psychological Association, board of scientific affairs (chairman), 1959–61. Advisory committee on graduate laboratory development program, National Science Foundation, 1961. Behavioral sciences training committee (psychobiology), Institute of General Medical Sciences, U.S. Public Health Service, 1962–65. Midwestern Psychological Association, American Psychological Association, Psychonomic Society, American Academy of Neurology, American Association for the Advancement of Science, Society for Psychophysiological Research (president, 1961–62), American Psychosomatic Society, Sigma XI, Phi Kappa Phi.

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EXHIBIT 19D—MARTIN THEODORE ORNE

General:
Address: Harvard Medical School, Department of Psychiatry, 74 Fenwood Road, Boston, Mass.
Telephone: Aspinwall 7-0910 (area code 617).
Date of birth: October 16, 1927.
Present position:
Senior research psychiatrist, Massachusetts Mental Health Center.
Director: Studies in hypnosis and human ecology projects.
Associate in psychiatry, Harvard Medical School.

Education:
Undergraduate: Harvard University, A.B., cum laude, 1948. Major: Social relations.
Graduate:
University of Zurich, 1948–49.
Harvard University Graduate School of Arts and Sciences, A.M., clinical psychology, 1951.
Tufts University Medical School, M.D., 1955.
Internship, Michael Reese Hospital, Chicago, 1955–56.
Residency in psychiatry, Massachusetts Mental Health Center (Boston Psychopathic Hospital), 1956–59.
Harvard University Graduate School of Arts and Sciences, Ph. D., 1958.

Teaching appointments:
Visiting lecturer, Department of Psychology, University of Mainz, Germany, summer, 1953.
Teaching fellow in psychiatry, Tufts Medical School, 1957–58.
Teaching fellow in psychiatry, Harvard Medical School, 1957–59.
Lecturer, Department of Social Relations, Harvard University, 1958–59.
Research associate, Department of Social Relations, Harvard University, 1959–60.
Instructor in psychiatry, Harvard Medical School, 1959–62.
Visiting lecturer, Department of Psychology, University of Sydney, Australia, summer, 1960.
Associate in Psychiatry, Harvard Medical School, 1962– .
Visiting lecturer, Department of Psychology, University of California, Berkeley, summer, 1962.

Current consultant appointments:
Member, Advisory Committee on Behavioral Sciences Research of the Air Force Office of Scientific Research, Washington, D.C.
Consultant, psychotherapy study at the Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital.
Consultant, Institute for Defense Analysis, Washington, D.C.
Consultant, Committee on Research in Hypnosis, Office of Naval Research, Department of the Navy, Washington, D.C.
Research consultant, experimental psychiatry, Boston State Hospital.

Research grants:
Postdoctoral fellow, National Institute of Mental Health, 1956–57.
Principal investigator of grant from Society for the Investigation of Human Ecology in Special States of Consciousness, 1958–63.
Principal investigator of contract No. AF49(638)–728 from the Air Force Office of Scientific Research for an investigation of the nature and uses of hypnosis as a control technique, 1959–62.
Principal investigator of research grant No. M–3369 from the Public Health Service, National Institute of Mental Health for studies in hypnosis, 1959– .
Principal investigator of research contract No. Nonr–3952 from the Office of Naval Research for an empirical investigation of basic research problems in hypnosis and related states, 1962– .
Principal investigator of research grant No. AF–AFOSR–88–63 from the Air Force Office of Scientific Research for a scientific investigation of personality attributes of good hypnotic subjects, 1962– .

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Principal investigator of research contract No. DA-49-193-MD-2480 from the U.S. Army Medical Research and Development Command for a scientific investigation of studies in the detection of deception, 1963- .

Professional society appointments:

Editor, International Journal of Clinical and Experimental Hypnosis, 1961- .

Secretary-treasurer, Society of Psychophysiological Research, 1962- .

Steering committee, New England Psychological Association, 1962- .

Professional society memberships:

American Association for the Advancement of Science.
American Group Therapy Association.
American Medical Association.
American Psychiatric Association.
American Psychological association (fellow).
Massachusetts Medical Society.
New England Psychological Association.
New York Academy of Sciences.
Society for Clinical and Experimental Hypnosis.
Society for Psychophysiological Research.

EXHIBIT 20—LETTER FROM MAXINE BELL RIEGER, POLYGRAPH EXAMINER, TO DR. H. B. DEARMAN, APRIL 1, 1962, WITH ATTACHMENT

Dr. H. B. DEARMAN,
Department of Psychiatry,
University of Virginia Hospital,
Charlottesville, Va.

DEAR MR. DEARMAN: Regarding your letter of March 26, I have rewritten the report in an effort to simplify it for printing—I fear this is easier said than done. I retyped your format because I only give positive or negative results; a good polygraph examiner does not know the meaning of the word "inconclusive." I also reworded the conclusions—the polygraph does not tell whether the subject is lieing or telling the truth—it only shows physiological reactions to verbal stimulus. This psysiological reaction may be indicative of deception, reflective thought, emotional feeling for the question, etc., and it is foolhardy of any examiner to pass judgment on an individual without interrogating him to determine just what these physiological reactions indicated on the polygram mean.

In my first report I listed all the questions on which I would interrogate ——— because even though question 12 was negative on the second polygram, I do not feel the perfunctory remark he made after the first test was sufficient to completely remove it from the chart. As you notice in this report—he reacted on question 10 in the second test and I believe that No. 12 became No. 10 to him in the second test. I know this sounds real stupid, but that is the feeling I have about this question.

In the accompanying report this is the way I see the questions lined up in brief:

FIRST TEST

6. Do you know anyone who has been stealing money from the ——— branch or its customers?

49. Are you 27 years old? (This reaction probably implies he feels some emotional connotation to his being 27 years of age—either he is approaching 30 too fast, may be feeling impotent, or any number of things.)

7. Have you ever stolen any money from the bank or its customers§

12. Have you ever stolen any money from the customers of the bank other than your wife or mother?

14. Have you in fact stolen any money from the customers of the bank?

3. Do you drink coffee? (This reaction probably implies he had a cup of coffee recently he didn't like the taste of.)

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SECOND TEST

He reacted to 16 and 50 which are control questions and which I expected him to react strongly—everyone does.

4. Do you smoke cigarets? (This reaction may imply that he feels he smokes too much, or has received some criticism recently in that area, or he may have smoked a cigaret that day that he didn't exactly enjoy the taste of.)

a–6. With the exception of what you just told me, do you know anyone who has been stealing money from the ——— branch or its customers?

7. Have you ever stolen any money from the bank or its customers?

10. Have you ever stolen any money from the bank? (We have a delayed reaction which is indicative usually of reflective thought which might be as I suggested earlier a revamping in his mind of question 12—since we had cleared up in our discussion any theft of money from his mother in childhood, he might have recalled the imagined theft in his own mind of his wife's money to repay his father-in-law. Lord knows what it could be—without discussing it with him it is impossible to know for sure.)

11. Have you ever stolen any money from the customers of the bank?

14. Have you, in fact, stolen any money from the customers of the bank?

I still believe because of the strong reactions which I indicated as such on the accompanying report, that your hypothesis still holds firm despite question 10 rearing its ugly head.

I hope I have not made my report too long, but the polygraph technique is not simple and all the additional information I included has to be there for one unpardonable sin for a polygraph-examiner is to assume anything, from an examination. The polygraph is used only as an aid to interrogation enabling the examiner to know which areas need to be exploited further through interrogation—would that it were as simple as the layman thinks it is.

Please don't think I am lecturing you over your ideas of the polygraph—I appreciate your inexperience with the machine and your exposure to some pretty lousy polygraph technique with the past examiner you worked with—I am only attempting to clarify the accompanying report and enable you to get some sense out of it because it is sometimes difficult to do—even for the polygraph-examiner.

I would like an opportunity to come to Charlottesville and speak with the doctors in the department of psychiatry to enlighten them on just what the polygraph does accomplish so they may know just how it may be used in any future research regarding human personality, etc.

Please excuse the typographical errors in this letter, but it is 10 p.m. and I am pooped. I do hope I have made my report a little clearer, but if not please don't hesitate to send it back and I will be glad to do what I can to clarify it for you. If you wish you may call me at my home phone—UL 5–2984 for any quick information you might desire. I am leaving for North Carolina tomorrow for a week's testing but should be back home by Friday.

The best of luck to you on the publication of your article, and I shall be looking forward to receiving a copy of it. Let me say again what a pleasure it was working with you on this, it marks one of the highlights of my polygraph work this year.

Sincerely,

MAXINE RIEGER.

NORFOLK, VA., *March 9, 1962.*

ARRANGEMENTS

At the request of Dr. H. B. Dearman, of the University of Virginia Hospital, Charlottesville, Va., ——— was examined on the polygraph, a detection of deception technique. He was examined for the purpose of determining his physiological reactions on the polygraph to certain questions prepared and numbered in advance by Dr. Dearman and unknown to the polygraph examiner prior to the test.

After surveying the list of questions the polygraph examiner requested permission of Dr. Dearman to obtain some additional irrelevant questions directly from ——— so as to follow routine polygraph procedure in the questioning

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technique. Permission was granted and the following irrelevant questions were asked, with the accompanying information that was obtained:

What is your age?—27 years.
What is the date of your birth?—March 11, 1934.
What is the place of your birth?—————.
What education do you have?—B.A. degree in English.
Where do you live at present?—————————.

After the first test, the polygraph examiner consulted briefly with Dr. Dearman outside the polygraph room and asked permission to add two control questions:

16. Do you have any intentions of trying to lie to me during this test?
50. Have you deliberately lied to any of these questions?

Permission was also granted to discuss a couple of the questions from the first test briefly with ———. The questions and his answers are stated below:

6. Do you know anyone who has been stealing money from the ——— branch or its customers?

Answer. He knew ——— who worked in the ——— branch of the bank, who had placed 25 cents left by a customer in an envelope and when the customer returned later neither ——— or he could locate the money—it was missing from the envelope. This incident was the only thing that came to his mind when asked this question—and he wondered who could have taken the 25 cents.

12. Have you ever stolen any money from the customers of the bank other than your wife or mother?

Answer: The thought occurred to him he might have stolen something from his mother as a child and couldn't recall it at this moment.

The examiner informed ——— that in the second test she would rephrase questions 6 and 12 with the expression "With the exception of what you just told me" so as to be sure they had made allowances for the information already obtained in the discussion following the first test.

——— remarked at this time that every time a question had been asked by the examiner during the first test he had felt as though he couldn't breathe. The examiner rechecked his pneumograph chest tube, and he remarked it had not felt too tight during the test.

CONCLUSIONS

It is the opinion of the examiner, Maxine Bell Rieger, that had interrogation been permitted, it would have been conducted on the following relevant questions which showed such specific reactions indicative of deception:

FIRST TEST

6. Do you know anyone who has been stealing money from the ——— branch or its customers?
7. Have you ever stolen any money from the bank or its customers?
12. Have you ever stolen any money from the customers of the bank other than your wife or mother?
14. Have you in fact stolen any money from the customers of the bank?

SECOND TEST

a–6. With the exception of what you just told me, do you know anyone who has been stealing money from the ——— branch or its customers?
7. Have you ever stolen any money from the bank or its customers?
11. Have you ever stolen any money from the customers of the bank?
14. Have you in fact stolen any money from the customers of the bank?
10. Have you ever stolen any money from the bank? (A delayed reaction to this question shows some reflective thought that should be investigated through interrogation.)

MAXINE BELL RIEGER,
Polygraph-Examiner.

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FIRST TEST

1. Is your first name ———?
Blood pressure, pulse: negative.
Breathing pattern: negative.
Sweat gland activity: negative.
Conclusion:
( ) Specification reaction indicative of deception without verification through interrogation.
(×) No specific reaction indicative of deception.

2. Do you live in the State of ———?
Blood pressure, pulse: negative.
Breathing pattern: positive.
Sweat gland activity: negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(×) No specific reaction indicative of deception.

6. Do you know anyone who has been stealing money from the ——— branch or its customers?
Blood pressure, pulse: positive; (strong).
Breathing pattern: positive.
Sweat gland activity: positive.
Conclusion:
(×) Specific reaction indicative of deception without verification through interrogation.
( ) No specific reaction indicative of deception.

49. Are you 27 years old?
Blood pressure, pulse: negative.
Breathing pattern: positive.
Sweat gland activity: positive.
Conclusion:
(×) Specific reaction indicative of deception without verification through interrogation.
( ) No specific reaction indicative of deception.

7. Have you ever stolen any money from the bank or its customers?
Blood pressure, pulse: Positive.
Breathing pattern: Positive.
Sweat gland activity: Negative.
Conclusion:
(×) Specific reaction indicative of deception without verification through interrogation.
( ) No specific reaction indicative of deception.

8. Have you ever kept any cash overages?
Blood pressure, pulse: Negative.
Breathing pattern: Negative.
Sweat gland activity: Negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(×) No specific reaction indicative of deception.

41. Do you have a B.A. degree in English?
Blood pressure, pulse: Negative.
Breathing pattern: Negative.
Sweat gland activity: Negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(×) No specific reaction indicative of deception.

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10. Have you ever stolen any money from the bank?
Blood pressure, pulse: negative.
Breathing pattern: negative.
Sweat gland activity: negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(×) No specific reaction indicative of deception.

11. Have you ever stolen any money from the customers of the bank?
Blood pressure, pulse: negative.
Breathing pattern: negative.
Sweat gland activity: negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(×) No specific reaction indicative of deception.

42. Were you born in 1934?
Blood pressure, pulse: negative.
Breathing pattern: negative.
Sweat gland activity: negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(×) No specific reaction indicative of deception.

12. Have you ever stolen any money from the customers of the bank other than your wife or mother?
Blood pressure, pulse: Positive (strong).
Breathing pattern: Positive.
Sweat gland activity: Positive.
Conclusion:
(×) Specific reaction indicative of deception without verification through interrogation.
( ) No specific reaction indicative of deception.

13. Have you in fact stolen any money from your wife or mother?
Blood pressure, pulse: Negative.
Breathing pattern: Negative.
Sweat gland activity: Negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(×) No specific reaction indicative of deception.

43. Is your birthday March 11?
Blood pressure, pulse: Negative.
Breathing pattern: Positive.
Sweat gland activity: Negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(×) No specific reaction indicative of deception.

14. Have you in fact stolen any money from the customers of the bank?
Blood pressure, pulse: Positive (strong).
Breathing pattern: Positive.
Sweat gland activity: Positive.
Conclusion:
(×) Specific reaction indicative of deception without verification through interrogation.
( ) No specific reaction indicative of deception.

3. Do you drink coffee?
Blood pressure, pulse: Positive.
Breathing pattern: Positive.
Sweat gland activity: Negative.
Conclusion:
(×) Specific reaction indicative of deception without verification through interrogation.
( ) No specific reaction indicative of deception.

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9. Are you withholding any information necessary to the prevention of theft from the bank?
Blood pressure, pulse: Negative.
Breathing pattern: Negative.
Sweat gland activity: Negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(×) No specific reaction indicative of deception.

4. Do you smoke cigarettes?
Blood pressure, pulse: Negative.
Breathing pattern: Positive.
Sweat gland activity: Negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(×) No specific reaction indicative of deception.

45. Is today Wednesday?
Blood pressure, pulse: Negative.
Breathing pattern: Negative.
Sweat gland activity: Negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(×) No specific reaction indicative of deception.

SECOND TEST

1. Is your first name ———?
Blood pressure, pulse: Positive.
Breathing pattern: Negative.
Sweat gland activity: Negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(×) No specific reaction indicative of deception.

2. Do you live in the State of ———?
Blood pressure, pulse: Negative.
Breathing pattern: Positive.
Sweat gland activity: Negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(×) No specific reaction indicative of deception.

16. Do you have any intentions of trying to lie to me during this test?
Blood pressure, pulse: Positive.
Breathing pattern: Positive.
Sweat gland activity: Negative.
Conclusion:
(×) specific reaction indicative of deception without verification through interrogation.
( ) No specific reaction indicative of deception.

4. Do you smoke cigarettes?
Blood pressure, pulse: Negative.
Breathing pattern: Positive.
Sweat gland activity: Positive.
Conclusion:
(×) Specific reaction indicative of deception without verification through interrogation.
( ) No specific reaction indicative of deception.

a–6. With the exception of what you just told me, do you know anyone who has been stealing money from the ——— branch or its customers?
Blood pressure, pulse: Positive (strong).
Breathing pattern: Positive.
Sweat gland activity: Positive.
Conclusion:
(×) Specific reaction indicative of deception without vertification through interrogation.
( ) No specific reaction indicative of deception.

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7. Did you ever steal any money from the bank or its customers?
Blood pressure, pulse: Positive (strong).
Breathing pattern: Positive.
Sweat gland activity: Positive.
Conclusion:
(X) Specific reaction indicative of deception without verification through interrogation.
( ) No specific reaction indicative of deception.

40. Is your birthday March 11?
Blood pressure, pulse: Positive.
Breathing pattern: Negative.
Sweat gland activity: Negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(X) No specific reaction indicative of deception.

8. Have you ever kept any cash overages?
Blood pressure, pulse: Negative.
Breathing pattern: Positive.
Sweat gland activity: Negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(X) No specific reaction indicative of deception.

10. Have you ever stolen any money from the bank?
Blood pressure, pulse: Delayed, positive.
Breathing pattern: Positive.
Sweat gland activity: Negative.
Conclusion:
(X) Specific reaction indicative of deception without verification through interrogation.
( ) No specific reaction indicative of deception.

5. Do you know how to drive an automobile?
Blood pressure, pulse: Negative.
Breathing pattern: Negative.
Sweat gland activity: Negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(X) No specific reaction indicative of deception.

11. Have you ever stolen any money from the customers of the bank?
Blood pressure, pulse: Positive (strong).
Breathing pattern: Positive.
Sweat gland activity: Negative.
Conclusion:
(X) Specific reaction indicative of deception without verification through interrogation.
( ) No specific reaction indicative of deception.

45. Do you have a B.A. degree in English?
Blood pressure, pulse: Positive.
Breathing pattern: Negative.
Sweat gland activity: Negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(X) No specific reaction indicative of deception.

a–12. With the exception of what you just told me, have you ever stolen any money from the customers of the bank other than your wife or mother?
Blood pressure, pulse: Negative.
Breathing pattern: Positive.
Sweat gland activity: Negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(X) No specific reaction indicative of deception.

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13. Have you in fact stolen any money from your wife or mother?
Blood pressure, pulse: Negative.
Breathing pattern: Positive.
Sweat gland activity: Negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(×) No specific reaction indicative of deception.

48. Are you 27 years old?
Blood pressure, pulse: Positive.
Breathing pattern: Negative.
Sweat gland activity: Negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(×) No specific reaction indicative of deception.

14. Have you in fact stolen any money from the customers of the bank?
Blood pressure, pulse: Positive (strong).
Breathing pattern: Positive.
Sweat gland activity: Negative.
Conclusion:
(×) Specific reaction indicative of deception without vertification through interrogation.
( ) No specific reaction indicative of deception.

49. Were you born in ———?
Blood pressure, pulse: Negative.
Breathing pattern: Positive.
Sweat gland activity: Negative.
Conclusion:
( ) Specific reaction indicative of deception without verification through interrogation.
(×) No specific reaction indicative of deception.

50. Have you deliberately lied to any of these questions?
Blood pressure, pulse: Positive (strong).
Breathing pattern: Positive.
Sweat gland activity: Negative.
Conclusion:
(×) Specific reaction indicative of deception without verification through interrogation.
( ) No specific reaction indicative of deception.

9. Are you withholding any information necessary to the prevention of theft from the bank?
Blood pressure, pulse: Positive.
Breathing pattern: Positive.
Sweat gland activity: Negative.
Conclusion:
(×) Specific reaction indicative of deception without verification through interrogation.
( )No specific reaction indicative of deception.

EXHIBIT 21—SUMMARY OF NATIONAL LABOR RELATIONS CASE NO. 5–CA–2051; IR–198–62

The Southland Corp. doing business as Seven-Eleven Stores (7–11 Stores) and Retail Store Employees Local Union 400, Retail Clerks International Association, AFL–CIO (National Labor Relations case No. 5–CA–2051; IR–198–62).

The trial examiner found—and the National Labor Relations gave tacit approval—that "polygraph inquiry into past union activities and future union intentions was neither lawfully related to the question of hire nor relevant to the question of whether employees had engaged in misconduct." Therefore, the corporation had committed an unfair labor practice by asking the following questions: (1) "Have you ever been active in any type of employee-union?" and (2) "Do you intend to engage in union activities if employed by 7–Eleven?"

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Exhibit 22A—Material supplied by Dr. H. B. Dearman in response to a request by Congressman John E. Moss

MARCH 9, 1962.

To Dr. H. B. DEARMAN.

Arrangements: At the request of Dr. H. B. Dearman of the University of Virginia Hospital, ——— was examined on the polygraph, a detection of deception technique. He was examined for the purpose of determining his physiological reactions on the polygraph to certain questions prepared in advance by Dr. Dearman and unknown to the polygraph examiner prior to the test.

Procedure: On February 28, 1962, ——— was examined in a private room in the University of Virginia Hospital with only the examiner, Maxine Bell Rieger, and ——— present. Dr. H. B. Dearman observed the examination in an adjoining room through a two-way mirror. The polygraph examination itself consisted of the following:

A blood pressure bladder and cuff was wrapped around the upper part of his left arm with the bladder centered over his brachial artery. The bladder was inflated to a point approximating the arithmetic mean blood pressure, or midway between his systolic and diastolic blood pressure for the purpose of recording a continuous indication of his pulse rate, pulse wave amplitude, relative blood pressures and variations therein.

A corrugated rubber tube was fastened around ——— chest for the purpose of recording a continuous indication of his respiratory pattern and variations therein.

An insulated seating for two protuding electrodes was fitted on his right hand for the purpose of recording a continuous indication of his sweat gland activities and variations therein.

He was instructed to sit still, keep both feet flat on the floor, avoid unnecessary movements during the running of the tests and to answer each of the questions with the single word, "yes," or "no."

A Keeler polygraph, serial number 6303, to which the above accessories were attached was then activated in accordance with standard procedure, thus initiating the continuous and simultaneous recordings described above.

The following questions were submitted to the polygraph examiner by Dr. H. B. Dearman:

1. Is your first name ———?
2. Do you live in the State of ———?
3. Do you drink coffee?
4. Do you smoke cigarettes?
5. Do you know how to drive an automobile?
6. Do you know anyone who has been stealing money from the ——— branch or its customers?
7. Have you ever stolen any money from the bank or its customers?
8. Have you ever kept any cash overages?
9. Are you withholding any information necessary to the prevention of theft from the bank?
10. Have you ever stolen any money from the bank?
11. Have you ever stolen any money from the customers of the bank?
12. Have you ever stolen any money from the customers of the bank other than your wife or mother?
13. Have you in fact stolen any money from your wife or mother?
14. Have you in fact stolen any money from the customers of the bank?

After surveying the list of questions the polygraph examiner requested permission of Dr. Dearman to obtain some additional irrelevant questions directly from ——— so as to follow routine polygraph procedure in the questioning technique. Permission was granted and the following irrelevant information was obtained:

Age: 27 years.
Date of birth: March 11, 1934.
Place of birth: ———.
Education: B.A. degree in English.
Present address: ———.

In the beginning of each of the tests irrelevant questions were first asked for the purpose of indicating the subject's normal tracing plus excitement with verbal stimulus, and then through the balance of each of the tests relevant questions submitted by Dr. Dearman were interspersed with the irrelevant questions for the purpose of indicating any significant changes from ——— normal

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tracing plus excitement level with stimulus when asked questions concerning the object of the examination compared with his normal tracing plus excitement level with verbal stimulus not pertaining directly to the object of the examination. At the beginning of each test there was an "announcement of test beginning" indicated on the polygrams with two x's, and at the conclusion of each test there was an "announcement of test ending" indicated on the polygrams with two X's.

FIRST TEST

The following questions were asked on the first polygram in the following sequence:

Sit perfectly still, keep your feet flat on the floor, look straight ahead, answer all my questions with "yes" or "no"; the test is about to commence.

1. Is your first name ———?
2. Do you live in the State of ———?
6. Do you know anyone who has been stealing money from the ——— branch or its customers?
49. Are you 27 years old?
7. Have you ever stolen any money from the bank or its customers?
8. Have you ever kept any cash overages?
41. Do you have a B.A. degree in English?
10. Have you ever stolen any money from the bank?
11. Have you ever stolen any money from the customers of the bank?
42. Were you born in 1934?
12. Have you ever stolen any money from the bank?
13. Have you in fact stolen any money from your wife or mother?
43. Is your birthday March 11?
14. Have you in fact stolen any money from the customers of the bank?
3. Do you drink coffee?
9. Are you withholding any information necessary to the prevention of theft from the bank?
4. Do you smoke cigarettes?
45. Is today Wednesday?

XX. The test is now over and I will soon be releasing the blood pressure cuff.

Mechanical settings on the polygraph at the beginning and ending of test I:

Arithmetic mean blood pressure registered 74.

Galvanograph section of polygraph was on self-center with the reactivity control knob set on No. 1, and the subject's resistance control knob registering 70,000 ohms.

At the conclusion of the test which consisted of 7 minutes, the arithmetic mean blood pressure registered 68.

The galvanograph section's reactivity control was still on No. 1 with the subject's resistance control registering 50,000 ohms.

The pulse rate of ——— during the test was 138 beats per minute.

Chart interpretation of test I:

Question 6. Do you know anyone who has been stealing money from the branch or its customers?

In the cardiosphygmograph section of the polygraph pattern there was a rise in the diastolic pressure and a decrease in the systolic pressure with a double bounce occurring 5 and 10 seconds after the initial question stimulus.

In the pneumograph section of the polygraph pattern there was a change in the inhalation-exhalation ratio along with a drop in the apex line of the pneumograph pattern.

In the galvanograph section of the polygraph pattern there was a rise in the pattern.

Question 7. Have you ever stolen any money from the bank or its customers?

In the cardiosphygmograph section of the polygraph pattern there was a rise in the diastolic pressure with a partial return and another rise resulting in a double bounce.

In the pneumograph section of the polygraph pattern there was a change in the I–E ratio.

In the galvanograph section of the polygraph pattern there was a slight decrease.

Question 12. Have you ever stolen any money from the customers of the bank other than your wife or mother?

In the cardiosphygmograph section of the polygraph pattern there was a sharp rise in the diastolic pressure along with an increase in the systolic pressure.

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Followed by a partial return to the base line and another slight rise in the diastolic pressure resulting in a double bounce.

In the pneumograph section there was a decided change in the I–E ratio, accompanying a drop in the apex line of the pattern.

In the galvanograph section there was a rise which was sustained throughout the remainder.

NOTE.—At this point in the test the self-center control in the galvanograph section of the polygraph was changed to normal control, which allowed for a wider range of reaction by the subject.

Question 14. Have you in fact stolen any money from the customers of the bank?

In the cardiosphygmograph section there was immediately upon asking the question a decided rise in the diastolic pressure with a decided decrease in the systolic pressure. Followed by a partial return to base line and another slight rise in diastolic pressure 13 seconds later, with an accompanying sharp rise in diastolic pressure and decrease in systolic pressure 20 seconds after question stimulus.

In the pneumograph section there was a change in the I–E ratio, and a gradual decline in the apex line of the pattern.

After the first test

The polygraph examiner consulted briefly with Dr. Dearman outside the polygraph room and asked permission to add two control questions:

16. Do you have any intentions of trying to lie to me during this test?

50. Have you deliberately lied to any of these questions?

Permission was also requested to discuss a couple of the questions briefly with ———. Dr. Dearman granted both requests.

Discussion that followed after first test

Question 6. Do you know anyone who has been stealing money from the ——— branch or its customers?

——— was asked by the polygraph examiner what came to his mind upon being asked this question. He replied he was thinking of ——— worked in the ——— branch of the bank, who had taken 25 cents left by a customer on the table, placed it in an envelope with the customer's name on it and when the customer returned later the money was missing from the envelope.

Question 12: Have you ever stolen any money from the customers of the bank other than your wife or mother?

——— remarked that the thought occurred to him that he might have stolen something from his mother as a child and couldn't remember it.

——— remarked at this time that every time a question had been asked by the examiner during the test he had felt as though he couldn't breathe. The examiner rechecked his pneumograph chest tube and he said it had not felt uncomfortable during the test.

The examiner informed ——— that in the second test she would rephrase questions 6 and 12 with the expression—"With the exception of what you just told me" so as to be sure they had made allowances for the information already obtained in the discussion following the first test.

SECOND TEST

The following questions were asked during the second polygraph test in this same series:

Sit perfectly still, keep your feet flat on the floor, look straight ahead, answer all my questions with "yes" or "no" the test is about to commence.

1. Is your first name ———?
2. Do you live in the State of ———?
16. Do you have any intentions of trying to lie to me during this test?
4. Do you smoke cigarettes?

a–6. With the exception of what you just told me, anyone who has been stealing money from the ——— branch or its customers?

7. Did you ever steal any money from the bank or its customers?
40. Is your birthday March 11?
8. Have you ever kept any cash overages?
10. Have you ever stolen any money from the bank?
5. Do you know how to drive an automobile?

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11. Have you ever stolen any money from the customers of the bank?
45. Do you have a B.A. degree in English?
a-12. With the exception of what you just told me, have you ever stolen any money from the customers of the bank other than your wife or mother?
13. Have you in fact stolen any money from your wife or mother?
48. Are you 27 years old?
14. Have you in fact stolen any money from the customers of the bank?
49. Were you born in———?
9. Are you withholding any information necessary to the prevention of theft from the bank?
50. Have you deliberately lied to any of these questions?

The test is now over and I will soon be releasing the blood-pressure cuff.

Mechanical setting on the polygraph at the beginning and ending of test II:

Arithmatic mean blood pressure registered 84 on the sphygmomanometer dial.

The galvanograph section of the polygraph was on normal control with the reactivity control knob set on 80, and the subject's resistance control knob registering 50,000 ohms.

At the conclusion of the test which consister of 8½ minutes the arithmatic mean blood pressure registered 78 on the sphygmomanometer dial.

The reading of the galvanograph section remained the same.

The pulse rate of ——— during the test was 132 beats per minute.

Chart interpretation of polygram on test II:

Question a-6: With the exception of what you just told me, do you know anyone who has been stealing money from the branch or its customers?

In the cardiosphygmograph section of the polygraph pattern there was a decided rise in the diastolic pressure and a decrease in the systolic pressure for 7 seconds with a rise in the systolic pressure at that time and a continued rise in diastolic pressure which was maintained for 10 seconds.

In the pneumograph section of the pattern there was a decided decrease in the apex line and a change in the I–E ratio.

In the galvanograph section there was a rise immediately upon announcement of test beginning which was sustained throughout the test.

Question 7. Did you ever steal any money from the bank or its customers?

In the cardiosphygmograph section of the pattern there was a sharp rise in the diastolic pressure immediately upon insertion of question stimulus followed by increase in systolic pressure raising the apex line of the pattern. A partial return to base line with fall in diastolic pressure and followed by rise in diastolic pressure resulting in a triple bounce.

In the pneumograph section of the pattern there was a change in both apex and base line of the pattern, accompanying a change in I–E ratio.

Question 11. Have you ever stolen any money from the customers of the bank?

In the cardiosphygmograph section there was a drop in the entire pattern to the pen stop at the bottom of the paper.

In the pneumograph pattern there was a drop in the apex line of the pattern, and a change in the I–E ratio.

Question a–12. With the exception of what you just told me, have you ever stolen any money from the customers of the bank other than your wife or mother?

In the cardiosphygmograph pattern there was a rise in the diastolic pressure 6 seconds after question stimulus was inserted.

In the pneumograph pattern there was a change in apex and base lines as well as a change in I–E ratio.

Question 14. Have you in fact stolen any money from the customers of the bank?

In the cardiosphygmograph pattern there was a decided sharp rise in diastolic pressure with a partial return to base line followed by a second rise in diastolic pressure, partial return, third rise, return to base line, and fourth rise in diastolic pressure. There was also an increase in apex line of the pattern.

In the pneumograph pattern there was a drop in the apex line, two apneas, and a change in the I–E ratio.

CONCLUSIONS

——— was dismissed from the polygraph examination room following the polygraph testing. The polygraph examiner did not interrogate as it was not in the original arrangements with Dr. Dearman to do so.

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It is the opinion of the examiner, Maxine Bell Rieger, that had interrogation been permitted it would have been conducted on the following questions which showed such marked physiological reactions on the polygrams of the first and second tests:

6. Do you know anyone who has been stealing money from the ——— branch or its customers?

7. Have you ever stolen any money from the bank or its customers?

11. Have you ever stolen any money from the customers of the bank?

12. Have you ever stolen any money from the customers of the bank other than your wife or mother?

14. Have you in fact stolen any money from the customers of the bank?

MAXINE BELL RIEGER,
Polygraph Examiner.

EXHIBIT 22B—LETTER FROM BURKE SMITH, PH. D., CHAIRMAN, PSYCHOLOGY DEPARTMENT, UNIVERSITY OF VIRGINIA MEDICAL CENTER, TO DR. H. B. DEARMAN, APRIL 23, 1964

UNIVERSITY OF VIRGINIA HOSPITAL,
DEPARTMENT OF NEUROLOGY AND PSYCHIATRY,
Charlottesville, Va., April 23, 1964.

Dr. H. B. DEARMAN,
Johnson City, Tenn.

DEAR H. B.: With regard to your question of whether specific emotions can be identified from polygraph records, I have the following to report. I first consulted one of the physiologists in the medical school who indicated that he knew of no relevant research and that very probably such research would more likely have been done by psychologists rather than by physiologists. This was my opinion, and we had searched the literature in preparation for our paper and found nothing to indicate that emotions could be identified from the polygraph record. I then raised the question with the department's research committee and the consensus of opinion there was essentially the same as indicated above. A couple of people maintained that it might be theoretically possible to identify an emotional response by differential analysis of polygraph records under controlled laboratory conditions, but we were all in agreement that for practical purposes and clinical purposes the techniques were not sufficiently refined. One point that I think should be made is that in life situations it is very rare to experience a pure emotion of fear or rage or love; rather, most of our emotional experiences are mixed. Furthermore it was agreed that individual variations were very probably so great that baselines would have to be established for each subject in a polygraph experiment before attempting to analyze the data.

I also consulted a recent book, "General Experimental Psychology," by Lawrence M. Baker, published by the Oxford University Press, New York, 1960. On page 225, in a chapter entitled "Bodily Changes and Psychological Phenomena," Dr. Baker has the following paragraphs:

"We do not seem to be ready to attack some of the oldest problems regarding emotion with much hope of success at the present time. There is almost no recent scientific progress that can be pointed to in the matter of differentiating between emotions. Yet, the demands placed upon psychologists to discriminate between such emotions as fear, rage, jealousy, hate, and love continue. Simply asking the individual about his feelings is still a widely used procedure. Studies of bodily changes cannot be said to be very promising at present if we work toward a solution to these particular problems. On the other hand if we make a different approach and look upon emotion as a descriptive term used to denote level of energy mobilization, an aspect of motivation and organization of behavior, we may be able to ask a different set of meaningful questions. Skill in describing and predicting what can be expected of the individual under varying circumstances may in time emerge.

"While it is readily conceded that studying emotions by cataloging bodily changes is not a highly effective one this approach is defended because it appears that we have nothing better at present. To take a defeatist position that we can never understand, predict, or control the phenomenon that has been referred to as emotional or affective behavior in man remains unjustified. Closely tied in with the patterns of emotional complexities are the goals toward which we work in all scientific endeavor. It may well be that part of the difficulty has grown out of the segmenting of emotions into a small part of psychology when the subject matter really permeates all psychological problems. Further-

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more, the separation of some of these problems from the general objectives of science and the philosophy of living might be a doubtful procedure. To abandon attempts to comprehend the problems of emotion and motivation is dangerously close to accepting the idea that we can do no better than to proceed blindly toward many of the basic goals which man, for better or worse, is forever setting up for himself.

"However frustrating or futile our attempts to study emotion may seem to be, a decision to abandon all effort in this vital area is unthinkable. Only animals without imagination can live without participating in the events of the past and the future; man can be expected to press toward desired goals, endeavoring to control or to avoid those situations, whether physical or psychological in nature, that threaten his survival or well-being. Intermingled with these strivings are the sensations, feelings, and behavior that have been referred to as emotional, and man will keep trying to understand them."

Sincerely,

BURKE SMITH, Ph. D.,
Chairman of the Psychology Department, University of Virginia Medical Center.

[Journal of Applied Psychology, 1963, vol. 47, No. 6, 408–411]

EXHIBIT 23—EFFECTS OF HEIGHTENED MOTIVATION ON THE DETECTION OF DECEPTION [1]

(By Lawrence A. Gustafson and Martin T. Orne, Massachusetts Mental Health Center and Harvard Medical School, Boston)

One of five cards was selected by each S and 2 minutes association to this card was required. GSR response to the selected card was compared to the responses for nonselected cards in 2 groups of Ss. 1 group was motivated to "deceive the operator and withhold responses." The other group was given no special instruction. The hypothesis that Ss who are motivated to deceive will more frequently produce disproportionately large skin resistance responses to critical items as opposed to noncritical items than will Ss who have not been so motivated was upheld. Ss who were motivated to deceive were more successfully detected. In addition detection took place at a much greater than chance level in the motivated group, while in the other group it occurred only at chance levels. The degree of autonomic response to significant stimuli appears to be a function of the motivational state of the S.

The apparent causal relationship between certain classes of verbal stimuli and physiological responses is the basis for the detection of deception by means of a polygraph. While variables which may increase or decrease the number of successful detections are often mentioned, these variables have not been manipulated experimentally.

It has been postulated repeatedly that the factor which produces the physiological response is not lying or guilt per se but rather something relating to the consequences of being detected (Burtt, 1921; Chappell, 1929; Marston, 1917). This has been formulated as the punishment, or threat of punishment, theory (Davis, 1961). According to this theory, the greater the consequences of being detected the greater the physiological response will be to the critical items, and therefore the greater the chance of detection. However, the consequences of detection have not been treated as an independent variable. This would be one of the critical tests for the theory: If no differences were found when the consequences were varied, the theory would not be valid.

On the basis of the previous observations, it is hypothesized: Subjects who are motivated to deceive will more frequently produce disproportionately large skin resistance responses to critical items as opposed to noncritical items than will subjects who have not been so motivated. The frequency of detection among the motivated group is therefore likely to be greater.

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[1] The research in this study was supported in part by the Institute for Experimental Psychiatry and by the Mental Health Research Training Program, Harvard Medical School. The authors wish to express their appreciation to Emily Carota Orne for her critical comments in the preparation of this manuscript.

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METHOD

Subjects

Thirty-six male subjects between 18 and 25 years of age were recruited for a "paid psychological experiment" from the employment offices of four colleges in the Boston area. None of the subjects had previously participated in a study in deception. All subjects were randomly assigned to one of two experimental groups—18 to each group.

Procedure

Subjects were run individually. Upon reporting, all subjects were given a very ambiguous idea of the nature of the experiment. They were told that the purpose of the study was to find out how normal subjects reacted physiologically to a series of numbers and letters, that it would be necessary to attach a number of recording electrodes to them, but that none of the electrodes would carry current to them. Electrodes for recording skin resistance (Wenger, Engle & Clemens, 1957) and five other variables were then attached. (The remaining variables will be discussed in a later paper.) At this point a tape recording was played to half the subjects according to a random schedule, previously determined. This group was referred to as the tape group, while the remaining subjects were in the no-tape group. This recording contained the following information: (*a*) the experiment was designed to see how well the subject could keep information away from the experimenter; (*b*) that this was extremely difficult to do, and that only people of superior intelligence and great emotional control were able to do this; (*c*) they were to try as hard as they could to beat the experimenter and the equipment; and (*d*) if they were successful, they would be paid an extra dollar.

All subjects then picked a card from a deck of five cards. All the cards in a deck were either all number or all letter cards, with a single character on each. Half the time the letter deck was used, and half the time the number deck. The numbers were between two and nine and the letters between B and I.

The cards were arranged so the subject could not see the face of the card until he had drawn. The experimenter could not see the face at any time. After the subject had memorized the card, he placed it face down on a stand beside him. In order to make the selected card more significant to the subject, he was instructed to write down on a piece of paper, in the case of a letter card, all the words he could think of beginning with that letter, or, in the case of a number card, all the expressions and titles he could think of containing that number. He was given 2 minutes for the task. The subject was then told to lie down and relax as much as possible, and that after about 5 minutes he would hear a series of numbers (or letters), including the number (or letter) he had removed from the deck. He was not to respond verbally to any of these. The experimenter left the room and began recording the physiological measures on an Offner Type R dynograph located in an adjacent room. At the end of 5 minutes he turned on a tape recording and one item of information was presented every 15 seconds. The first item presented was a dummy foil, while the next five were the same as the characters on the five cards. After all six had been presented, they were presented in a different order. This was repeated until each character had been presented five times.

As each character was reproduced by the tape recorder, the signal pen on the polygraph was activated and the letter or number was written on the record. At the conclusion of the tape, the experimenter returned to the subjects' room and did one of three things, according to a previously arranged, randomized order. To one-third of the subjects in each group he told which card they had picked, to one-third he deliberately misinformed them as to which card they had picked, and to the remaining third he said nothing concerning the card they had picked. The reasons for this design will be discussed in a separate paper.)

The subject then picked a card from a second deck. If the first deck had been numbers, the second was letters and vice versa. The remainder of the trial was exactly the same as the first trial.

The difference in skin resistance between the level immediately prior to the stimulus and the lowest level reached within 4 seconds was used as the response measure for each stimulus. Readings were made to the nearest 500 ohms. The readings were all made by a person who did not know in which group the record belonged and did not know which was the chosen letter or number.

The largest mean response was used as the predictor of the card that the subject had chosen. The mean responses for each character were determined and these means were then ranked, the largest response receiving a rank of 1.

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The rank of the character chosen by the subject was then determined. If this rank was 1, it was considered a correct detection, while if it was more than 1, it was considered as not successful.

RESULTS

The ranks of the selected card for Trials I and II for all subjects are shown in Table 1 for the tape and no-tape groups, along with the number of correct predictions.

TABLE 1.—*Mean ranks for the selected characters for different conditions*

Trial	No-tape condition		Tape condition		Mann-Whitney *U*
	Mean rank	Number of correct predictions	Mean rank	Number of correct predictions	
I	2.36	6	1.44	12	[1] 90.0
II	2.86	4	1.81	11	[1] 88.5

[1] $p<0.05$, $n_1=n_2=18$, two-tailed.

NOTE.—Fisher exact probability tests of detectional rates for no-tape and tape conditions for Trials I and II yield: $p<0.05$.

A comparison was made between the ranks of the selected character for the tape and no-tape condition on Trials I and II. The Mann-Whitney *U* for Trial I was 90.0 and for Trial II was 88.5. Both of these are significant at the 0.05 level (two-tailed).

While primary concern of this study as put forth in the introduction was to determine whether difference in subject motivation would affect the magnitude of the response to a chosen card in relationship to the magnitude of the response to other cards, it is also of interest to see how successful detection itself was in the two conditions.

Fisher exact probability tests for Trials I and II for the two conditions indicated that there was a significant difference in the number of correct detections between the tape and no-tape conditions (see Table 1). It was decided to see if detection was occurring at a greater than chance frequency in both groups. A binomial test indicated that for both Trials I and II the tape group was detected at a significantly greater than chance frequency ($p<0.001$ on both trials) while for the no-tape condition this was not the case ($p>0.10$ on both trials).

The records of those subjects who were in the tape group appeared to show both larger and more frequent responses, not only to the correct character but to all the characters. These differences were significant at the 0.05 level (Mann-Whitney *U*; two-tailed).

DISCUSSION

The significant difference between the ranks of the selected character in the tape and no-tape conditions (for the first trial 1.44 and 2.36, and for the second trial 1.81 and 2.83, respectively) with corresponding differences in the relative response size to critical and noncritical items for both trials is supportive of the hypothesis put forward in the Introduction of this paper and the punishment theory of detection of deception. According to this theory the "person will give a large physiological response during lying because he anticipates serious consequences if he fails to deceive [Davis, 1961, p. 163]." In the present experiment, while the subject is paid an extra dollar if not detected, probably the greatest consequence of being detected would be a loss of self-esteem. In the tape it is mentioned that the only persons who are able to deceive are those with superior intelligence and great emotional control, two qualities which most undergraduate students cherish. (The experimenter was careful to assure the subjects who had been detected that it had been difficult and that they had put up a good struggle.) Marston (1917) suggested that the factors which make detection possible are not directly due to the response of lying, but rather are due to an emotional reaction, probably of fear, surrounding the verbal response of lying. Burtt (1921) found that having other people present during the detection procedure increased the likelihood of successful detection. In a study by Chappell (1929), it was found that simply having the subject lie without any possibility of detection or punishment did not produce any marked responses. Further,

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Larson (1922) had noted that after a confession, the critical items no longer produced responses. Here again the stimulus no longer produces a response after the consequences of deception have been eliminated.

Our findings by no means eliminate alternate explanations of the events underlying the detection of deception. In this experiment the consequences of being detected are quite different for the motivated group not only during the actual recording session, but also during the period when they are memorizing the card and associating to it. In terms of a conditioned response theory, it would be assumed that during the period of making associations to the card, a greater response is probably produced for the tape group than for the no-tape group because of their increased involvement and this becomes conditioned to the selected character and produces a larger response during the test situation. A future experiment which would resolve this issue would be to change the consequences of deceiving during different parts of the experiment. Certain trials could be highly rewarded for deception while other unmotivated trials could be run for an innocuous reason, such as to "check the equipment." Any differences in the relative sizes of the responses would clearly be due to differences in the consequences of being detected and not due to differences in the ressponses conditioned to the selected card.

The significant differences between the number of successful detections (that is the number of times a critical item was assigned a rank of 1) for the tape and no-tape conditions uphold our hypothesis that the number of successful detections is increased as motivation is increased. It also lends support to the consequences theory mentioned earlier.

It is of interest to see what ranks were assigned to the critical items in cases where the subject was not successfully detected. In the tape condition on Trial I, of the 6 individuals who were not detected, 4 were assigned a rank of 2 on the critical number. Even in cases where detection did not occur, the critical item produced an abnormally large response and the assignment of ranks was not random. However, in the no-tape group, of the 12 who were not assigned a rank of 1 on the critical item, only 3 were assigned a rank of 2 on the critical item.

Individuals in the tape group were not able to suppress the response to the critical item, though they were able to enhance their response to one or more noncritical items.

The fact that motivated subjects were detected far more readily than chance, supports the claims made for lie detection in actual life contexts where motivation would be maximal. On the other hand, the finding that without special motivation detection in the laboratory is difficult explains some of the skepticism toward laboratory studies of deception (Berrien, 1939). Clearly the situational variables play a crucial role in the responses of the autonomic nervous system.

As mentioned in the preceding section, the tape and no-tape groups appeared to be different, not only in the number of responses made to the selected card, but to all cards. While autonomic responses are usually considered to be more or less out of the area of experimental control, except by the manipulation of certain characteristics of the stimulus, such as the intensity or duration, here we find that by manipulating the role of the subject we have greatly altered his responsiveness to a stimulus which objectively remains unchanged. This relationship of the demands of the experiment to autonomic nervous system (*ANS*) activity is a factor that has not been considered in the discussions of response specificity and stimulus specificity. One can only speculate concerning the effect that different expectations of experimenters have on the nature of their subjects' responses. This relationship between the subject's role and ANS activity could be important for a theory of the etiology and treatment of psychosomatic disorders.

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EXHIBIT 24A—MEMORANDUM FOR THE RECORD—PLANNING CONFERENCE BY INSTITUTE FOR DEFENSE ANALYSIS ON TRUTH DEMONSTRATION TECHNIQUES, MINUTES OF MEETING HELD ON JUNE 9, 1961, BY HERBERT POLLACK AND JESSE ORLANSKY, JULY 3, 1961

PLANNING CONFERENCE ON TRUTH DEMONSTRATION TECHNIQUES

Minutes of meeting, June 9, 1961

The meeting was called to order at 9:30 a.m. by the chairman, Dr. Ralph Gerard, with the following participants in attendance:

Stephen Aldrich	Joseph Kubis	Kent K. Parrott
Albert F. Ax	John I. Lacey	Herbert Pollack
Lewis C. Bohn	David T. Lykken	Orr Reynolds
Charles W. Bray	Donald Michael	David Rhodes
Leonard J. Duhl	J. Mooney	John A. Talbot
John Ford	Linwood Murray	Marion A. Wenger
Ralph Hardin	Jay Orear	
Marshall Heyman	Jesse Orlansky	

The chairman said that the purpose of the meeting was to discuss the possible application of lie detection techniques as one means of inspection to enforce arms control agreements and also as a means of demonstrating the truthful intent of participants in negotiations. The meeting would be unclassified and only publicly available information would be discussed.

The following agenda was presented to the group:

1. Technical aspects:
   - Instrumentation.
   - Procedures.
   - Interpretation.
2. Political aspects:
   - Feasibility.
   - Appropriate channels.
   - Procedures.
3. Further steps.

The first topic to be discussed was instrumentation, of which the main purpose is the "objective" measurement of emotions. Up to some point, the interpretation of emotions improves as more variables are recorded and measured. The most useful variables are those which can be measured most accurately, such as the galvanic skin response, heart rate, pulse and blood pressure, etc., and which, of course, correlate highly with the emotional state of the subject. The interpretation of recordings with many variables requires sophisticated statistical procedures and the use of a computer. Attempts have been made to identify the most discriminating variables. There was some disagreement about the conclusion that one could identify specific emotions, such as anger or fear, by the pattern of automatic responses. It was felt that this type of identification is still a preliminary phase.

A distinction was made between "lie detection" and the "detection of guilty knowledge." The first assumes that lying involves a specific emotional arousal and that it can be detected by measuring autonomic responses. The second assumes that knowledge of guilty information is available only to the participants of a crime and therefore that a unique pattern of autonomic responses can exist only for those who possess guilty information. The use of the galvanic skin response alone has been sufficient to detect 100 percent of those who had guilty knowledge in an experiment involving students.

Much discussion was concerned with the relation between autonomic response and specific emotional states. The autonomic responses upon which lie detection depends would be influenced markedly by the context of particular words and the word habits of the individual. In one study, words with low response uncertainties gave low GSR responses, whereas words with high response uncertainties gave high GSR responses. An individual with multiple responses available to a given word tended to give GSR reactions of a highly emotional type.

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The discussion continued on the techniques of how different liars lied, and on the patterning of the autonomic variables. Although there may not be a typical pattern of autonomic responses indicative of lying in general, nevertheless each individual may exhibit a consistent pattern of responses whenever he lies. From this came the concept that it might be possible to establish a man's normal responses as a basis for judging whenever he lies; this was called "titrating the man."

An individual's social role, such as chief of state, may create a situation in which it is his duty to lie and, as such, lead him not to exhibit any emotional response connected with lying. In dealing with a chief of state, the general conclusion was that subjective inference of intent would probably override any "objective" evidence collected by polygraph methods. The evaluation of false negative and false positive responses would have to be taken into account.

Countermeasures to the use of lie detection techniques were also discussed. The existence of many false positive reactions would undermine the lie detection technique. Several possible countermeasures were considered:

(*a*) The "Hindu" system of going into a trance may make the person oblivious to stimuli.

(*b*) The deliberate use of muscular tension can introduce irrelevant responses into the recording techniques.

(*c*) The development of an exciting image within the subject's own imagination could confuse the recording to a very large extent.

Thus, there are many ways of contaminating the responses and of increasing the difficulty of interpretation. However, the use of such countermeasures could be detected and thus the operator would be alerted to take corrective measures. The validity of the polygraph recordings depends upon the operator's ability to identify such sources of error and on the suspect's ability to induce spurious reactions which would not be noticed. The role of drugs in stripping an individual of his resistance and of altering his responsiveness was discussed very briefly. It was concluded that the use of drugs is merely an adjunct to the interrogation and measurement process. Though it may have some value, great care must be used in interpreting the results.

The discussion then moved over to political aspects in the use of lie detection techniques. Final proof of an attempt to circumvent an arms control agreement would require physical evidence. Hence, even lie detection techniques of low reliability may be acceptable if they are used to indicate a reason to search There was a short discussion on the influence of anxiety on the individual's selected at random to represent a typical sample of scientists or political figures by methods similar to those used in questionnaire or public opinion surveys. It was considered possible that the Communists might limit the knowledge of nuclear tests to platoons or cells, as the Communist countries call them, as a means of evading nonphysical detection techniques. Clearly, an individual would not react to a lie detection technique if he did not have any guilty knowledge.

Three questions were asked but not answered in the discussion: Is the technique scientifically valid? Is it socially acceptable? Is it politically acceptable? There was a short discussion on the influence of anxiety on the indivdual's autonomic responsiveness, on the stabilization of the cardiovascular and vasomotor response with different age groups, and of their effects on this type of recording.

The guilty knowledge technique rests on the assumption that a guilty person will show some involuntary physiological responses to stimuli related to remembered details of his crime. If the crime is such that the investigator can discover a number of factual details with which only the guilty person should be familiar, then the guilty knowledge method can be used. The guilty knowledge items are interspersed with other similar but irrelevant items in a stimulus list. In a test ban agreement, the examiner could use a preliminary interview method to establish the details for which he would be looking in a guilty knowledge test and thereby help him search for knowledge of new weapons, with unknown characteristics, not included in a test ban agreement.

The final part of the session was concerned with future planning. The group developed the following research concepts, listed without regard to order of importance.

1. Lie detection instrumentation and techniques should be reevaluated under real field conditions.

2. Multiple variables must be chosen very carefully and only the most critical ones should be used. These were considered to be changes in respiration, muscle tension, skin resistance, cardiovascular and vasomotor reactions, and eye motion.

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3. Research should be undertaken to examine the influence of a person's social and political role upon his autonomic responses.
4. Attention should be paid to the use of corneal reflections to measure the direction in which the eye is looking, as pointed out by R. C. Davis in 1958.
5. Electroencephalograms may possibly be used if sufficient research is done to understand the meaning of the phase changes.
6. Improved techniques for automatic data recording and processing are important in the evaluation of multiple recordings.
7. Equipment should be minaturized in order to make it more portable and reliable.
8. Work should be conducted on "bugs" in a lie detection system, such as false positives and false negatives.
9. The cost-effectiveness of nonphysical and physical inspection concepts should be compared with the knowledge that they may be complementary rather than redundant.
10. Evaluation of the social acceptability of lie detection techniques is most desirable, both in our own, as well as in foreign cultures. When dealing with people from other cultures, other variables are introduced beside the subject and interrogator. These are the interpreter, the semantic differential associated with words used in the interview and the unknown social sensitivity of the individual to the test procedure. All of this must be studied if we wish to use lie detection in other cultures.
11. While it would be desirable to develop a technique which automatically gives evidence of a lie, it is conceivable that pattern reading would also be acceptable.
12. It was considered desirable to study collective or group lying.
13. Reliability checks are desirable for comparing the performance of several interrogators on the same subject or test material.
14. Further work must be done to determine the actual existence of pathological liars, and to evaluate the extent to which test records can be contaminated by such people.
15. What means, such as drugs, hypnosis, special equipment or special psychological procedures can be used deliberately to introduce spurious effects into test records.
16. A study should be made, perhaps using public opinion techniques to examine how people in the street would react to questions concerning their possible knowledge of secret work on arms development or on weapons testing. This is in recognition of the fact that the technical questions involved are only one phase of a major sociological and political problems.
17. Further work is required to study by physiological or other means whether it is possible to detect an intention to act in the future.

There was some discussion about the possibility of creating an international research group, including the United States, U.S.R.R., and other countries to explore and improve these techniques for mutual interest.

The meeting ended with the affirmation that lie detection techniques had sufficient merit to warrant their consideration as part of an inspection scheme for an arms control agreement and, possibly, for application as a truth demonstration device in political negotiations.

EXHIBIT 24B—MEMORANDUM TO THE IDA FILE ON LIE DETECTION—MINUTES OF A MEETING, AUGUST 9, 1961

Topic:

Research to improve the objective measurement of autonomic responses for use in lie detection, July 20 and 21, 1961.

Institute for Defense Analyses, Research and Engineering Support Division, Washington, D.C.

Attendees:

Albert F. Ax.
Lewis Bohn (July 20).
Chester Darrow.
Ralph Gerard, Chairman (July 20).
John I. Lacey.
David C. Lykken.
Martin T. Orne.
Jesse Orlansky (Chairman on July 21).
Herbert Pollack.

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MINUTES

Since the last meeting it was planned to have four small meetings dealing respectively with the problem of inspection, the instrumentation of lie detection, the interview aspects of lie detection, and the diplomatic and political uses of lie detection. Further, the use of this technique in various agencies will be examined. The meeting on inspection took place on July 19, 1961, and led to the conviction that behavioral inspection (nonphysical inspection) offers a number of major advantages and does not have the serious deficiencies of the physical testing methods and that therefore it is definitely worthwhile to explore further on the state and improvability of the art.

Various autonomic responses may be used as measures of emotional state for the purpose of lie detection. There is some basis for dividing autonomic responses into those associated with attention which would be primarily cortical and might involve such responses as the GSR, and into those associated with guilty knowledge, which are primarily subcortical and might involve such responses as blood pressure. This dichotomy is by no means sharp and there is evidence that a fallen heart rate might be the most sensitive indicator of attention changes. Further, defense in the sense of social guilt is not entirely the same as defense at the physiological level of injury. Another dichotomy is suggested in terms of the instrumental situation: those which are analog or voltage measurements, and those which are time measurements. Since time measurements are easy and precise, and since it is possible to convert voltage measurements into time ones, this may be an important methodological consideration. In general, responses which are close to the basic physiological changes, which are relatively rapid, and which do not adapt out rapidly in repeated testing, would be relatively preferred; blood flow is a good indicator for these reasons.

A final dichotomy is in terms of responses which could be used on large scale field testing with great numbers of subjects, and those which would be practicable only under more limited use with very special subjects and better working conditions.

The following autonomic responses were considered especially useful:

Blood pressure: This may be feasible only under limited conditions.
Breathing rate and pattern.
GSR, especially palmar sweating.
Pulse volume, pulse rate, or pressure, depending upon the instrumental choice (photoelectric, impedance, and pressure transducers).
Velocity of pulse wave.
Systolic and dyastolic blood pressure (may be available only under limited conditions).
Frontalis muscle tension and muscle potential peaks (probably only under limited conditions, unless converted from voltage into time measures).
Finger tremor (limited conditions).
Gastrointestinal reactions, using a telemeter capsule (this would need investigation).
Ocular movements (especially for observing whether attention is directed to one position or another on a map, but also in many other general situations).
EEG (especially phase differences, using a minimal five lead cap).
Reaction time (especially latency of verbal and autonomic responses to a given verbal stimulus).
Ballistocardiograph (or the ankle accelerometer).
Blood oxygen concentration (ear oximeter).

In all these there is, besides the immediate response value, the possibility of long-range shifts in baselines associated with a progressive shift in emotional state, such as the anxiety level. Some of the measures might be especially useful in this latter case.

Research should be undertaken in two directions. The first would involve laboratory testing of multisensor, multichannel systems to discover what valuable information could be obtained from patterns and combinations of autonomic responses. This involves data digitalization and the use of computers for data processing. The second involves field trials with a limited, well-established group of measurements, such as GSR, pulse, respiration pattern and rate, and relative blood pressure. This should also be done to test automatic data processing as far as possible. The field tests might involve actual work with police groups and an established criminal population, with student populations under

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the stress of examinations, with any group willing to accept severe punishment for being caught and a considerable monetary reward for participating, a "genuine" test such as hiding an ICBM and interrogating the groups that might have done it, and the like.

The kinds of tests should include straight lie detection, guilty knowledge detection, and zeroing in on a location or some other attribute beyond the knowledge of the interrogator. There is disagreement as to whether these methods involve different psychological processes or whether different physiological responses occur, or whether the difference is a matter of degree of attention and emotional involvement; but there is no disagreement that there would be a methodological difference both in the measurements and the interrogation procedure, depending on what one was after.

Telemetering with sensors on the body is now quite practicable. Some measurements could be made without any body attachments, such as skin temperature, respiration patterns and rate, eye movements, and possibly pulse rate by measuring the ballistic action of the body.

An additional measure suggested after the first list is the Luria technique which involves squeezing a bulb with one hand while maintaining the other steady. This seems to measure general level of emotionality or anxiety. Further, for field work, the data should be recorded on magnetic or paper tape and the question arose as to whether the interrogator should or should not have the responses of the subject before him. For many purposes, a pretaped interrogation could be used, for others not.

The questions of kinds of situations to use in examining the polygraph technique was discussed at length, especially the transfer from the artificial lie situation of the laboratory to real life. While it was agreed that the differences which seemed to be of kind might actually be only of degree (involving response curves of different slope) nonetheless various measures are better indicators in one case than in another. The questions of experimental design, of field testing and of laboratory testing, therefore, need special scrutiny.

On the question of titrating or calibrating the individual, despite considerable detailed disagreement, there was a general consensus that certain initial test examinations would be valuable. For one thing, one could measure general reactivity and perhaps exclude certain individuals as unsatisfactory for the detailed examination. For another, one can get an idea of the general reactivity of different indicators for a particular individual. This may help the judgment as to the validity of the subsequent examination without necessarily indicating what the results of the examination would be. There was also some disagreement on the use of different stressors, different modes of stressing, the use of different methods of interrogation for lying, the validity of transferring from artificial to real life responses and the like. Some of the specific stressors that have been considered are various drugs, cold, pain, sensory isolation, and different sorts of interview situations. Drugs, pain, or sensory deprivation might also be used as sensitizers to potentiate or magnify autonomic responses to the test situations. Here is clearly one area of research.

The multiphasic personality inventory or other paper and pencil tests might also be used to calibrate the individual. Although these could easily be "faked," the mere relation of responses on these to the polygraph findings would give evidence of the use of countermeasures. The point was reemphasized that some of these preliminary tests might be highly important in indicating the degree of validity of the actual tests from individual to individual.

There was general agreement that test stimuli and judgments should be as objective as possible. Photographs or movies could be used as a stimulus situation while moving pictures of the subject could be used as an indicator of the response. It is a matter for research as to whether the polygraph response to the possession of guilty knowledge will be alike or different to that of lying, depending upon the mood and other conditions under which the subject is tested. For example, will a man who is telling a lie to benefit himself react the same way when he is telling a lie as a patriotic duty to his country?

The use of corneal reflections, retinal potential measurements, or the Macworth camera was discussed to tell what a person is looking at and how important it is to him.

There seems to be less concern with false negatives than with false positives. False negatives are relatively unimportant when a considerable number of persons who might be presumed to have guilty knowledge are examined. False positives are regarded as more dangerous and reprehensible in the courts. There

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seems a reasonable chance that false positives could be rendered very rare by such techniques as: the use of multiple measurements, modifying the responsiveness of the subject with drugs (excitatory or depressed), repetition of tests, further exploration in detail of dubious responses, and the like. False negatives involve physiological lowering of activity (this might be overcome by drugs or prestressing); cultural unreactivity (this could be tested by investigating enough individuals of different cultures); or habitual lying (which could be tested by deliberate training studies, by working with trained individuals, and perhaps by selecting extreme personality types). Hypnotic and posthypnotic examination might be helpful in getting at this.

There was a discussion of amnesia, pathological lying, hypnotic amnesia, and the like. Possibly one could detect knowledge of which a person was unaware (or as to the source of which he was unaware) by the guilty knowledge procedures, even if not by straight lie detection. Research in this area is certainly possible, not only on "diplomats" but on "con-men" and "Madison Avenue" types.

On countermeasures and evasion, it is possible to recognize induced unreactivity (auto suggestion) as well as overactivity. Either of these may be detected because of abnormality in the overall record. Another type of evasion in which, as a result of specific training or conditioning, the individual is able to suppress knowledge of particular guilt areas might be a much more difficult problem. This is a matter for strength. One should distinguish between the possibility of knowing one is lying and still not giving an autonomic response from the possibility of actual suppression of lying associated with no autonomic response.

In connection with cultural and role effects, it is recognized that not only attitudes toward lying must be examined and allowed for, but also the meanings of words, the cultural usages, gestures, and the whole communication matrix. This may involve the need of linguistic experts.

Discussion of the detection of intentions went in two directions. On the one hand, it should be possible to ask questions in such a way that past events which would necessarily precede preparation for future acts are examined. On the other hand, the question arose as to whether intents are in a sense more pallid and, therefore, less likely to exhibit polygraphic responses than actually executed acts. This may be the case but it may even be the reverse, because the responses may be a measure not directly of intensity of emotion but of the range of available responses to a given individual and situation. For example, one can be more excited about a discussion of who one will vote for than who one did vote for.

Lie detection techniques may be applied to the following situations, each of which may possess some unique characteristics:

Guilt screening by police.
Arms control:
    On a population sample.
    On elite figures, e.g., politicians, scientists, industrialists.
    On top leaders.
Security screening and rescreening.
Diplomacy.
Business credit and pilfering investigations.
Legal applications.
Psychophysiological research.

Research on the following topics was considered desirable:

1. Replicate R. C. Davis' study on repeated trials with the GSR; he found greater success on second trials whereas the opposite is found in police work.

2. Develop a taxonomy and theory of lying; significant parameters probably include degree of perceived threat to the individual, the degree of guilt (or shame) and the relation of the lying response to group identity.

3. Experiments on lying, trying to generalize from one situation to another; e.g., try deliberately to "beat" the lie detection machine; try (by lying) to convince another person in the experiment that one is telling the truth.

4. Experiment on the guilty knowledge technique; e.g., manipulate the extent to which the experimenter has complete knowledge of the guilty information; and the extent to which the "guilty" group has complete or partial guilty data.

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5. Group experiments on lying; e.g., poker and bridge, an individual lying alone or in the service of a group; perhaps the autokinetic effect experiment can be adapted to such use.
6. Experiments on "training" the autonomic response; either to respond or to inhibit at will, in role-playing situations, with and without a feedback of polygraph data to the subject.
7. Experiments on the effect of repetition on autonomic response.
8. Experiments on the possible value of hypnosis and drugs to reduce the anxiety of subjects.

The following brief summary was made at the end of the meeting:

1. Increase the number of autonomic responses measured in studies of guilty knowledge and lie detection, coupled with computer data processing, as appropriate.
2. Study the effect of situational variables and of information feedback on autonomic responses.
3. Extend multiple recordings in police work to include skin temperature, plethysmograph and reliable GSR and blood pressure measures.
4. Examine the effect of drugs and hypnosis on autonomic responses.
5. Examine the extent to which differences exist between subjects, with persistent stereotyping of responses for individuals.
6. Field trials are most desirable, including measures of the lie detection ability of professional practitioners.

LIST OF ATTENDEES

Dr. Albert F. Ax, director, Psychophysiology Laboratory, Lafayette Clinic, 951 East Lafayette, Detroit, Mich.
Dr. Lewis C. Bohn, Lockheed Electric Co., Systems Research Center, 78 Ocean Way, Santa Monica, Calif.
Dr. Chester Darrow, Institute for Juvenile Research, University of Illinois, Chicago, Ill.
Dr. Ralph Gerard, Mental Health Research Institute, University of Michigan, Ann Arbor, Mich.
Dr. John I. Lacey, Department of Psychophysiology-Neurophysiology, Fels Research Institute, Yellow Springs, Ohio.
Dr. David C. Lykken, Department of Psychiatry and Neurology, the Medical School, University of Minnesota, Minneapolis, Minn.
Dr. Martin T. Orne, Massachusetts Mental Health Center, 74 Fenwood Road, Boston, Mass.
Dr. Jesse Orlansky, Institute for Defense Analyses, 1825 Connecticut Avenue NW., Washington, D.C.
Dr. Herbert Pollack, Institute for Defense Analyses, 1825 Connecticut Avenue NW., Washington, D.C.

EXHIBIT 25—TECHNICAL REPORT NO. 62-16—AN ASSESSMENT OF LIE DETECTION CAPABILITY, BY DR. JESSE ORLANSKY, JULY 31, 1962

INSTITUTE FOR DEFENSE ANALYSES, RESEARCH AND ENGINEERING SUPPORT DIVISION (IDA)

[Declassified May 13, 1964]

(Portions of this report have been deleted, for purposes of national defense, by the Director of Defense Research and Engineering, Department of Defense. Asterisks (three stars) indicate that less than a paragraph has been deleted and a line of seven stars indicates deletion of a paragraph or more.)

ACKNOWLEDGMENT

The author wishes to thank many individuals who assisted this study by providing information and by reviewing a preliminary draft. This assistance is acknowledged gratefully but the author alone is accountable for the views expressed in this report. Dr. Joseph E. Barmack of the Institute for Defense Analyses is due a special thanks for his help in preparing the final report.

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and to probing questions could permit a useful degree of discrimination between deceptive and truthful responses.

It is undoubtedly true that the measurement of physiological responses can be used to indicate the presence of subtle emotional states in many and perhaps in most people. What is not as well known is the accuracy with which such objective measures can indicate that an individual is attempting deception. This problem exists because a person being interrogated may be upset but not guilty. He could be upset, for example, by the interrogation procedure itself or by the aggressive manner of the interrogation. He could be embarrassed by the exposure of personal information not related to the purpose of the interrogation. The problem becomes one not of determining whether the person is responding emotionally but *why* he is responding emotionally.

The history, as well as the theory, method, and legal aspects of lie detection have been described elsewhere (Inbau and Reid (1953),[1] Trovillo (1939), Marston (1938), Lee (1953), Larson (1932)) and will not be summarized here except to assist the reader.

The basic method of lie detection and its associated equipment have been in use for about 50 years and much has been written about it. Nevertheless, few data are available at the present time concerning the effectiveness of lie detection. The existing data are not easy to interpret. This is due principally to the fact that lie detection equipment operators, primarily in police, civil, and military securty organizations, have not collected objective information concerning their methods and their results and probably do not appreciate the importance of doing so. On the other hand, few scientists have shown any interest in performing research on lie detection and, therefore, little has been done to clarify the problem. The inference that our knowledge about the effectiveness of lie detection is inadequate probably will be challenged by most polygraph examiners. The simple fact is that the data necessary to verify the results are not available. The use of lie detection methods has increased greatly over the last 10 years and perhaps this situation is now ready for improvement.

At one time it was believed that lie detection equipment provided direct evidence of lying. This claim is no longer made explicitly though the equipment is still referred to as "the lie box." Now, it is recognized that the equipment measures physiological responses, while it is the operator who infers deception from the physiological and other data. It has become known that fear of detection of deception is not the only emotion that may be encountered during an interrogation since other emotions, such as resentment or anger, can also be present. The individual being interviewed may be embarrassed or feel guilty because of personal experiences not related to the subject of the interrogation. The presence of such emotions could contaminate an inference about attempted deception. The polygraph examiner attempts to identify a pattern of emotional responses which recurs only with a specifc category of questions and it is precisely the accuracy with which this function can be performed which has not been objectively determined.

Lie detection equipment can be regarded only as an adjunct to, and not the sole means of, conducting an interrogation. Apart from the equipment, many other factors affect the outcome, such as the method of interview, expertness, and detachments of the examiner, and the accuracy of background information used for comparison with the interview results. Each affects the accuracy of an inference as to whether or not the polygraph record indicates deception. Such matters will be examined in this report.

A. METHOD OF STUDY

For the purpose of this study, visits were made to many organizations which employ the polygraph to discuss the procedures and to examine evidence for the effectiveness of this method. Both Government and non-Government agencies were visited. The Government organizations visited were those concerned with security operations, criminal investigations, research and development—all related to lie detection. Several all-day conferences were held with polygraph examiners and research scientists. The subjects of these companies were: (1) Research to improve lie detection * * *. There is a large literature pertinent to lie detection and this was examined extensively.

B. OPINIONS ABOUT LIE DETECTION

Virtually all polygraph examiners believe that lie detection procedures are highly successful, an opinion which has the benefit of substantial repetition.

[1] A complete bibliography appears at the end of the report.

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Favorable testimonials may be found in seminars held by the Academy for Scientific Interrogation (Leonard 1957, 1958) and throughout the *Journal of Criminal Law, Criminology and Police Science.* Alva Johnston (1944) wrote an entertaining series of articles on "The Magic Lie Detector" for *The Saturday Evening Post* about the work of an early exponent of lie detection, Leonarde Keeler, who is highly regarded by other polygraph examiners.

The polygraph also has detractors, three of whom may be briefly mentioned. Senator Wayne Morse (1952) regarded with disfavor the use of the lie detector in testing job applicants for the Defense Department because some interviews probing for homosexual tendencies appeared to be salacious in nature. Dwight MacDonald (1954) wrote two critical articles in *The Reporter* (a magazine) which emphasized the point that unethical practices in lie detection could constitute an abuse to civil liberties. Burack (1955) is concerned with the lack of professional standards in polygraph work and the lack of reliable data on the accuracy of the method.

There have been several surveys of opinions about the accuracy and value of lie detection tests. Cureton (1953) reports a poll of 88 psychologists conducted in 1926 by Dean C. T. McCormick of the University of North Carolina Law School. Replies were received from 43 percent of those who were polled; about half of these believed that lie detection tests furnished results of sufficient accuracy to warrant consideration by judges and jurors; about one-third indicated lack of belief.

In 1941, Dael Wolfle prepared a memorandum for the National Research Council on the use of lie detection equipment by the Federal Government. The memorandum is based on a survey of published literature, correspondence, and discussions with six expert polygraph examiners, nine research psychologists with some (but less extensive) experience in crime detection, and on observation of the work of the Chicago Police Laboratory and of some private laboratories. Thirteen of the 15 men (87 percent) felt that lie detection equipment in the hands of highly trained and experienced examiners provides accurate results where real criminal behavior is involved. Wolfle concludes that "with highly competent and well-trained operators a record of approximately 80 percent correct can be predicted."

In connection with a symposium on lie detection at the University of Tennessee College of Law, Cureton (1953) sent questionnaires to all groups and individuals known or believed to have some competence with polygraph procedures; i.e., polygraph examiners, psychologists, and criminologists. Analyses reported in the study are based on 711 completed questionnaires; i.e., 42 percent of 1,682 which were sent out. The data are shown in table 1. The belief that the polygraph is a highly valid device for recording physiological reactions may be found in decreasing order of agreement among polygraph examiners, polygraph examiners who are also psychologists, and psychologists who have observed polygraph tests. No appreciable portion of any group considers the polygraph invalid or useless when in competent hands. Psychologists who are not familiar with the device have a lower esteem for it than do those who are familiar with it.

TABLE 1.—*Opinions of polygraph examiners and psychologists as to the validity of polygraph procedures*

This table shows the replies of 711 persons. Numbers in parentheses indicate the size of each group; the total exceeds 711 because of some overlap.

Opinion	Percent of group holding opinion			
	Polygraph examiners (199)	Psychologists who have conducted polygraph tests in class or who have observed tests on suspects (230)	Polygraph examiners who are also psychologists (35)	Others (289)
The polygraph is highly valid for recording physiological reactions	83	63	63	15
Recommend court testimony on polygraph tests by competent examiners	47	51	60	42
Recommend periodic examination of certain personnel in business and indsutry	83	28	51	17

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C. APPLICATION OF THE POLYGRAPH

Many agencies of the Federal Government employ the polygraph method of lie detection in the security program and in criminal investigations, as follows:

(1) Preemployment screening in sensitive agencies: To judge the accuracy of information provided by an applicant on a personal-history questionnaire (i.e., attempted deception). In one agency, the polygraph test is administered before a background investigation is undertaken while in another agency only after the investigation has been completed. Critical areas where a truthful reply is sought include membership in Communist organizations, association with Communists, relatives living in Communist countries, conviction of a felony, history of emotional instability and homosexual activities.

(2) Prior to assignment to sensitive activities: Some organizations use lie detection prior to special assignments even though a person may have been cleared previously.

(3) Periodic security review: Periodic rescreening of all members of certain organizations for recent evidence of homosexual activities, security violations, etc.; and to verify the reports and activities of individuals who have returned from special oversea assignments which may have brought them into contact with enemy agents.

(4) Screening refugees or foreign agents: To evaluate the personal reliability of foreigners when a thorough background investigation is not possible; though preferably conducted in the foreigner's language, such tests are sometimes conducted through an interpreter.

(5) Criminal interrogation: To provide independent verification of information collected by other means in criminal investigations. In the military service, this applies to thefts of personal or Government property, arson, murder, willful destruction or sabotage of Government property, and, of course, serious violations of the security regulations.

Many police departments employ lie detection equipment in support of criminal investigations; the examiner may be a police officer or a private examiner hired for the purpose. Some commercial organizations and private examiners offer lie detection services on a fee basis to banks, supermarkets, department stores, and industrial organizations. The purpose of such services is to encourage honesty in filling out preemployment questionnaires and in the handling of money or expensive merchandise.

On an experimental basis, two of the three indicators used in lie detection equipment (galvanic skin response and respiration) have been employed to measure the level of interest in advertisements and in TV programs. The responses of a group of individuals have been measured simultaneously for such purposes (Backster, private communication, 1959, 1962). This work has not been reported publicly and its value (if any) is not known.

Many physiological responses, including those used in lie detection instruments, have been studied in research on emotions, drug effects, learning, bioastronautics, environmental contamination, hospital surgery, fatigue, personality, and psychotherapy. The purpose of these researches was not lie detection though some of the results can be applied to this field and will be reported below.

D. LEGAL STATUS

Some lawyers have been attracted by the possibility that lie detection could provide a powerful assistance to the ever difficult business of assessing the validity of testimony. This type of application has both proponents and opponents (Wicker (1953), McCormick (1926), Summers (1939), Burack (1958)).

At present, information collected "solely" by means of lie detection tests cannot be entered as evidence either in a civil procedure (Inbau and Reid, 1953, pp. 122–141) or a court-martial (Everett, 1955). The major reason cited by the courts is that lie detection does not have sufficient "scientific recognition among physiological and psychological authorities" to warrant the admission of testimony (*Frye* v. *U.S.*, 1923; *Henderson* v. *State*, 1951). The word "solely" is important because confessions otherwise obtained properly are not rendered inadmissible by the fact that a polygraph was used during the interrogation (Wicker, 1953). A polygraph examiner can be permitted to testify as to a confession received during the course of an examination even though the charts themselves are not admissible.

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There are two exceptions to the general statement of inadmissibility:

(1) Judges in trial courts have admitted polygraph results when both parties in a trial agree to take such a test, agree on the examiner, and with their attorneys, sign a stipulation agreeing in advance to the admission of the examiner's testimony on the same basis as other expert testimony.

(2) Some trial courts have admitted test results as evidence but whenever appeal has been made to higher courts, the latter have held that the test results are not admissible. Wicker (1953) cites 16 such cases.

A person cannot be forced to take a polygraph examination against his will and, in any case, it is doubtful that an effective examination could be accomplished on an uncooperative person. Adequate precedents have established that measurement of physiological processes and biochemical analysis of blood and urine for alcohol are not *per se* self-incriminating. However, since a person cannot be forced to testify against himself, neither can he be coerced into providing samples against his will. Thus, it is possible that the results of lie detection tests to which one has submitted voluntarily can, when and if there is greater agreement as to their validity, be introduced as evidence in legal proceedings.

The New York State Bar Association has sponsored legislation which would permit a court to order any party or witness to submit to lie detector tests and permit the results of such tests to be received in evidence on an issue of deception (Chatham, 1951). Polygraph examiners in New York, Illinois, California and the District of Columbia have supported legislation to establish licenses and standards for civil practice. Some labor unions have sponsored legislation to ban the use of the polygraph as a condition of employment. No attempt at legislation or licensing in behalf of the polygraph has yet been successful. In Boston, an act bans the use of the polygraph as a condition of employment.

Before proceeding with an examination, it is customary for the polygraph examiner to receive a signed and witnessed statement that the person who takes a test does so on his own free will. The agreement form reduces the opportunity of a disgruntled subject to claim that he had been coerced to submit to a polygraph test. The basis for this in military law is Article 31 of the Uniform Code of Military Justice which directs that no person subject to the Code shall interrogate or request any statement from an accused or a person suspected of an offense without telling him the nature of the accusation and that any statement made by him may be used as evidence against him in a trial by court-martial (Evertt, 1955). Thus, a person accused by the military has the right, as do those in civil life, to refuse a polygraph test. In one activity, the person to be tested executes a waiver which is usually witnessed by the polygraph examiner alone; in other activities, two witnesses and the examiner must sign before the examiner is authorized to proceed.

3. Lie Detection Equipment

Current lie detection equipment measures simultaneously three physiological responses:

	Device	Method of sensing
Physiological response:		
Breathing pattern	Pneumograph	Corrugated rubber tube around chest.
Blood pressure and pulse	Cardio-sphygmomanometer	Pneumatic pressure cuff around upper arm (or around wrist and forearm to minimize discomfort).
Skin resistance to external current.	Psycho-galvanometer	Finger or palmar surface electrodes.

The phrases "skin conductance," "electrodermal skin response," "psychogalvanic response," and "galvanic skin response" are used interchangeably to refer to the same phenomenon. In this paper, we will use only the phrase "galvanic skin response" and the letters "GSR."

Recent developments in medical electronics have made it possible to measure the breathing pattern, blood pressure, and pulse with electrical devices that are more accurate than the pneumatic ones which are in current use. It is also possible to interpret physiological responses by the use of automatic data processing equipment. The application of such procedures to lie detection is just beginning to be explored.

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Four companies produce virtually all the equipment used by professional lie detection examiners:

Associated Research, Inc., Chicago, Ill.: Keeler Polygraph.
C. H. Stoelting Co., Chicago, Ill.: Deceptograph.
Lafayette Instrument Co., Lafayette, Ind.: Polygraph.
Lee & Sons, San Rafael, Calif.: Berkeley Psychograph.

These devices cost from about $600 to $2,000 depending on the model and associated equipment. Though each device has its partisans, there is little to choose between them. Other equipments also exist but they are not in general use:

Darrow Photo-polygraph (Stoelting).
Higley Reactograph.
Electronic Psychometer (B & S Associates).
Cardio-pneumo-polygraph (Stoelting).
Electronic Lie Detector (Thompson Metrigraph Labs).
Chatham Polygraph (Associated Research).
Pathometer (Fordham University).

The term "polygraph" refers, most precisely, to the multiple-pen subsystem which records the instrumental responses on a roll of paper; through usage, it has come to represent the entire lie detection equipment. Frequently, an extra pen is used to mark the times during the interview at which questions were put to the person being examined. A time marker is not required because the recording paper contains time marks and is run at a constant speed of 6 inches per minute. More than three physiological responses may, of course, also be recorded on a polygraph but this is not typical in routine lie detection. One examiner employs two pneumograph tubes, one on the upper and another on the lower chest; many examiners are known not to use one (it may be any one) of the three "standard" indicators.

Suggestions have been made that other physiological responses, such as face temperature, electro-cardiograph (EKG), and electro-encephalograph (EEG) should be included in lie detection work but virtually no research has been accomplished to learn whether the addition of these indicators would increase the accuracy of lie detection. On the other hand, instruments which measure 10 physiological variables simultaneously are common in medical and phychophysiological research; one such instrument can record 29 channels in a form suitable for automatic data processing.

4. "Theory" of Lie Detection

Lie detection is an empirically developed procedure without an adequate theoretical foundation; it is an art and not a science. Lying may be a widespread and popular pastime but no attempt has been made to account for the extent and variety of physiological and behavioral responses which may be observed when a person attempts deception. To the best of our knowledge, there is not even a taxonomy of lying which defines the situation and purposes for which one person might attempt to deceive another. When one considers the amount of deception thought to exist in everyday life, it is surprising that no genius has arisen to codify this area.

As early as 1917, Marston recognized that some physiological responses probably always are present during an interrogation, whether or not a person is lying, but he thought that their magnitude would be larger when a person tries to deceive. The greater response would be due to some residue of learning, explainable in such terms as conditioned responses, conflict, or a threat of punishment (Davis, 1961, p. 161). However, the theoretical aspects of lie detection still await exploration and it is difficult to believe that this area of technology can develop without a theory.

5. Effectiveness of Lie Detection Methods

It should be possible to estimate the effectiveness of lie detection by the same methods that are employed in all classes of scientific observation and we shall start by examining the reliability and validity of lie detection.

a. validity

Validity is defined as an estimate of the extent to which an instrument (or test) measures what it is supposed to measure. As applied to lie detection, validity may be estimated by comparing the agreement between conclusions derived by use of the polygraph with other, independent measures of deception (or truthfulness). For example, a judgment, based on examining a polygraph record, that a person attempted to deny a previous conviction for felony may be compared to a court record of conviction. For practical purposes, independent

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evidence for validating lie detection tests would be gained from thorough background investigations. A confession of guilt (or the admission of an attempted deception) is often used for estimating validity but it is not a completely satisfactory independent criterion. It is rarely clear whether the confession came before the polygraph was attached or after; or whether a complete polygraph test was run; or whether the interrogator made his "judgment of deception based on the polygraph" before or after the confession. To put it simply, the nature of police or security work does not lend itself readily to precise experimental control. In many such cases, independent verification by other than self-incriminatory means, may not be achievable.

Lie detection would exhibit high validity when polygraph-derived data are consistent with independent data on deception, such as when those judged to be deceptive are later found to have been deceptive, and those judged to be nondeceptive are later found to be nondeceptive, etc. There would be low validity when those judged to be truthful are found later to have practiced deception; or when those judged to be deceptive are found later to have been truthful. In real life, the problem of determining validity is complicated because those who are judged to be deceptive are not ordinarily hired and that ends the matter; no further investigation is conducted to determine whether or not the person actually was deceptive, although that would be required to clarify the problem of validity. A thorough appraisal of validity would require data in nine cells:

Polygraph judgment	Independent evidence		
	Guilty	Innocent	Indeterminate
Guilty (or practicing deception)	*		
Innocent (or not practicing deception)		*	
Indeterminate (no conclusion possible)			

Obviously, high validity would require that the preponderance of cases fall in the starred (*) cells; and validity would decrease as the percent increases in any of the other cells.

B. RELIABILITY

Reliability measures the extent to which a test produces consistent or reproducible results. Reliability refers to the accuracy of measurement and should not be confused with validity. A test cannot be valid without also being reliable. Various aspects of reliability can be measured in the following ways:

(1) Comparing the results achieved by two or more examiners working independently on the same case material.

(2) Comparing the results of two or more tests on the same person taken at separate but close time intervals.

(3) Comparing the results of one part of an examination with another, e.g., odd versus even items on one subtest, two different physiological indexes, or two different methods of examinations (viz., peak of tension versus questionnaires).

In the current practice of lie detection, no attempt is made to measure the absolute values of the three physiological responses which are being recorded, though many such schemes have been proposed. The examiner judges the responses in a qualitative fashion, using visual inspection to compare the magnitude and pattern of responses to relevant and irrelevant questions. There is no objective method of reporting test results.

Little attention is directed to the accuracy of the three instruments used in the polygraph, though they may be precise enough for present purposes. The breathing and blood pressure instruments operate on pneumatic pressure and their response characteristics are obviously nonlinear. According to one manual,[2] air leaks in these two systems should not exceed a pen excursion of 0.25 inches in 30 seconds for the pneumograph and of 0.25 inches in 10 minutes for the sphygmomanometer. Disregarding the rate of leak, this is a 5-percent error over the entire scale of 5 inches; the true error would be two to three times larger than 5 percent because the three tracings share the 5-inch scale. The psychogalvanometer is a sensitive instrument which must be adjusted continuously to contain the responses on the scale; some units incorporate a self-centering feature. Darrow (1929) and Lacey (1949) have shown that, among the several possible ways of measuring the GSR responses (based on conductance or resistance), the log change in conductance is the most reliable one. Martin

[2] Prepared by the Office of Naval Intelligence.

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(1956) reports that the reliability of the GSR, measured as average skin log conductance, was 0.95 for a series of four sessions; although the absolute conductance values may change, individuals consistently maintained a large or a small response from one session to another.

Except for Kubis (1962), no one has explored the possibility that two examiners working independently might make different interpretations of the same record. Reliability of the polygraph in the sense of the consistency of measurement, i.e., agreement among examiners, is an unknown quantity.

C. EVIDENCE AVAILABLE IN THE GOVERNMENT

It is estimated that military and security agencies have conducted almost 200,000 polygraph examinations over the last 10 years, largely in connection with security screening. However, this experience has never been summarized and it is doubtful whether data remaining in the files can be utilized to provide an assessment of its effectiveness. Despite general assurance to the contrary, recordkeeping and performance appraisal on the use of the polygraph in the Government appears not to have been accomplished. If any review has been performed, the method of analysis and the results are not available for inspection despite a specific effort made to uncover them for this study.[3] A private organization which provides polygraph services on a fee basis was approached because its research director says that his reports are available for inspection by other

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[3] As might be expected, this statement drew some replies from examiners who reviewed a working draft of this report:

(1) "Studies have been performed at . . . correlating the results of polygraphs and background investigations. No studies have or can be made of the absolute validity or reliability of the polygraph by personnel assigned to this unit. The worth of the program in terms of confessions and information of security value has been established beyond cavil."

(2) "We feel that your report could only be improved with the inclusion and analysis of more complete statistical evidence which we both know is either nonexistent or not readily available to you."

(3) This statement "does not apply to the U.S. Army Military Police Corps. While it is true that certain data is not available in the Office of The Provost Marshal General, much information is available at major operating command headquarters and at the Provost Marshal General's School. The Provost Marshal General's School is continually testing and evaluating lie detector performance, to include improved application and examination techniques."

The Provost Marshal also provided the data shown in table 2. Indeed, these data are useful. It shows that among 1,302 examinations in which deception was indicated, 52 percent led to admissions and 19.8 percent were verified by further investigation, while 27.5 percent could not be substantiated. For examinations in which no deception was indicated, contrary results were obtained by other means in 2.3 percent (73/3,153) of the cases; 3.6 percent (167/4,622) of the examinations were inconclusive.

From the data, it is not possible to make any judgments about effectiveness of the polygraph in security investigations because success or failure to detect deception in such cases (117 among the 4,622) is not broken out in the table.

TABLE 2.—*Summary of lie detection examinations performed by the U.S. Army Military Police.* (See exhibit 26, p. 463.)

Total examinations conducted	4,622
Murder	28
Rape	96
Burglary	223
Security	117
Others	4,158
Refusals to submit to examinations	386
Admissions obtained in pretest interviews	438
Admissions obtained during or immediately after execution	478
Examinations in which deception was indicated	1,302
Examinations in which these indications led to admissions/confessions during examination	686
Examinations in which these indications were verified by further investigation or interrogation	258
Examinations in which these indications were not substantiated through investigation, interrogation, admission, or confession	358
Examinations in which no deception was indicated	3,153
Instances in this category in which contrary results were obtained through investigation or interrogation	73
Instances in which results of examination in this category were in accord with results of other investigative techniques	3,080
Examinations which were inconclusive	167
Complaints, if any, made against the lie detection examination procedure by those who were tested	4

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examiners or by qualified research personnel. The research director was not able to provide a record of the successess and failures of his organization.

Therefore, although the polygraph enjoys wide usage, we are not able to estimate its value. It is possible that the regard in which it is held is due largely to the ability of the examiners to conduct effective interviews and only slightly to the polygraph instrument itself; or the reverse. We do not know. Unless performance data are kept and analyzed, we cannot benefit from experience and recognize the areas in which improvement is possible. This cannot be desirable to the agencies which employ this method or to the polygraph operators who are responsible for providing an effective program. No useful purpose can be served here by providing still another testimonial of faith in the lie detector. Objective data and not testimonials are required. The simple fact is that the necessary data have not been kept and that an impartial appraisal of the polygraph has not yet been accomplished.

This implies no lack of respect for polygraph examiners. The author was impressed by the apparent sincerity, conscientiousness, and integrity of the examiners who conduct the interrogations and supervise the use of the polygraph. The author joins them in believing that the polygraph "works," and that it has been employed in a scrupulous manner. However, belief in the value of the polygraph or in the integrity of its practitioners is not evidence that the polygraph is an effective instrument.

The following claims, made verbally, show the result of nine visits to five Government organizations in search of data. Most of the data reflect experience in security screening. No records were offered for inspection; the numbers are based on notes made during the visits:

[In percent]

	Verified acceptances	Verified rejections	Inconclusive determinations	Demonstrated failures
Organization A	85	12	3	
Organization B				3.0
Organization C				
Organization D			5	.1
Organization E				

Blank entries indicate that no data were provided in some interviews; two organizations (B and D) appear not to keep performance data. "Inconclusive determinations" refer to cases in which the polygraph tracings did not permit the examiner to infer whether or not a person was deceptive (all other determinations are considered "conclusive"). "Verification" indicates that the judgment made from the polygraph record was supported by independent evidence. When the polygraph is used as part of the preemployment procedure for security screening, the term "verified acceptance" indicates that the polygraph-derived conclusion agrees with an independent background investigation and that the candidate was hired; "verified rejection" indicates confirmation of a decision not to hire. The distinction between acceptance and rejection is not considered significant for purposes related to accuracy of the polygraph since the percentage found in either category depends upon the type of applicants who appear for emloyment and the current criteria for acceptability; the percent of rejections is affected by the examiner's tendency to "play safe" by rejecting applicants whose record might in other circumstances be judged "inconclusive."

The total of verified judgments was reported to range from about 95 to 97 percent. "Failures" represent individuals who were hired but later found to be unacceptable or to have been deceptive. In these data, the failure rate is given as 0.1 percent; the report of 3 percent in organization C is not regarded as typical because it represents a single individual in a sample of 37 cases.

A private research organization, which works solely for one of the military services, instituted a program of semiannual polygraph examinations for its employees. The purpose of the program was to detect and to deter the illegal disclosure of classified information; on an initial examination, employees were asked questions concerning possible falsification of the personal history form and about homosexuality. Preemployment examinations were not given and it was not mandatory to take the test.

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A total of 4,573 examinations were conducted over a period of 8 years. In 27 (0.6 percent) of these cases, a report was made to the Security Office that the polygraph examination indicated certain undesirable characteristics or incidents, e.g., suspected Communist associations or homosexuality. As a result of reporting such information and of subsequent investigation by the Security Office, seven persons (26 percent of the 27 cases) were separated from the organization; the remainder (74 percent) retained their clearances and employment. Thus, among the 27 cases recommended for further investigation, reasons for separation were found in 26 percent and not found in 74 percent of the cases. The polygraph program has been discontinued at this organization though, in the view of the security staff, it was proven to be effective and it had continuing value as a deterrent.

Two comments in the open literature, probably based on security screening for two large Government agencies, supplement our table:

"Our own experience, covering more than 100,000 polygraph examinations (90 percent of which were personnel examinations) has recently been evaluated and reveals that in personnel work the proved margin of error is less than 1 percent and uninterpretable records did not exceed 2 percent" (Chatham, 1953, p. 917).

"Most well-run polygraph examinations claim accuracy of 98 percent and on up without undue exaggeration depending on the type of cases being processed" (Leonard, 1957, p. 43).

Thus, polygraph examiners believe that the polygraph produces verified results in 95 percent or more of the cases. However, data from which this conclusion may be derived are notable chiefly by their absence. In any case, they are not available for review and one may reasonably doubt whether such data exist in a form amenable to objective analysis. It is clear that no thorough review of these data has ever been accomplished and there is no demonstrable basis for an objective judgment for or against lie detection.

D. EVIDENCE REPORTED IN THE LITERATURE

Anecdotal evidence in support of lie detection is readily available in the literature. This type of evidence consists of charts collected in criminal cases, their interpretation (generally successful), and suggestions for conducting polygraphic investigations. These charts are useful for instructional purposes, but since they describe only selected cases, they provide no evidence for the percent of success or failure.

An extensive review of the literature produced data on criminal investigations and laboratory experiments which will be reported separately to preserve several distinctions between "real life" and "experimental" investigations. These distinctions relate to the degree of emotional involvement, the degree of control over the events which occur, and the precision of the data which differentiates these two situations.

(1) Criminal investigations

Table 3 summarizes the published data on the use of the polygraph in criminal investigations. The reports date from 1932 to 1953; no more recent data have been found. The crimes, which are not always described, involve the full range of police work, such as theft, embezzlement, and murder; one unusual report summarizes investigations concerned with claims about paternity.

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It was not possible to devise a consistent means of describing the accuracy of lie detection procedures that would apply to all reports and therefore the table contains some explanatory comments. The following headings are used in the table:

(*a*) Verified reports: Instances where it has been possible to provide independent confirmation of a judgment based on the polygraph examination. The most frequent example is a judgment of guilt followed by a confession of guilt.

(*b*) Indeterminable cases: Cases where an independent confirmation has not been made. The most frequent example is a judgment (of guilt or innocence) for a crime not supported by a confession. Unfortunately, this category includes some inconclusive polygraph examinations, described below.

(*c*) Proved error: Cases where a judgment of guilt or innocence can be shown to be in error.

(*d*) Inconclusive polygraph examinations: Cases where the results of a polygraph examination do not permit the examiner to make a high-confidence judgment of guilt or innocence.

The following conclusions may be derived from the data in table 3:

(*a*) In criminal cases, judgments based on the polygraph often cannot be verified. When verification is possible, such as reported by Trovillo (1951), the accuracy of lie detection ranges from 50 to 85 percent, for cases in which guilty judgments were supported by a confession. (About half of the cases in this sample was judged guilty.) But Inbau and Reid (1953) estimate accuracy as the percent of cases in which the examiner made a definite determination of guilt or innocence rather than an inconclusive one. This is an unusual application of the term "accuracy" (also see below). For Larson (1932), accuracy of 100 percent is based on finding one thief among 90 college girls.

(*b*) There are few reports on proved error. Where data are reported, proven errors occur up to 2 percent. In these cases, the guilty are more likely to be judged innocent than are innocent persons likely to be judged guilty.

(*c*) Inconclusive polygraph determinations occur in 10 to 20 percent of the cases.

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TABLE 3.—*Accuracy of polygraph reported in criminal investigations*

NOTE.—Numbers in parentheses do not appear in original reports but are calculations made by the author of this paper.

Type of investigation	Reference	Number of cases	Accuracy (percent)				Comments
			Verified reports	Indeterminable cases	Proved error	Inconclusive polygraph	
Thefts in a college dormitory	Larson, 1932	90	100				Based on confession of 1 guilty person.
Criminal suspects	do	861	79.5	20.5	0		Difficult to ascertain author's meaning; 20.5 percent may refer to inconclusive category.
Murder suspects	Luria, 1932	(1)	(2)				Verified by confessions; original study of muscle tremors.
Criminal cases	Summers, 1939	43	(100)				"All examinations confirmed by confessions . . . or by subsequent investigations" (p. 340).
Criminal suspects	Keeler, 1941		82	16.5	(3)		"Several diagnoses later found guilty . . . not guilty later found innocent" (Wolfle, 1940).
Embezzlement	MacNitt, 1942	59	99		(4)		Accuracy not defined; used GSR.
Do	Marcuse and Bitterman, 1946.	1					Suspect identified by witness and judged guilty after several lie detection tests; later exonerated by another's confession.
Criminal cases	Kubis, 1950	(5)	(90)		0	10.0	No errors of diagnosis reported . . . however, "no decision" category was rather large.

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Paternity cases:							
Complainants	Trovillo, 1951	21		(95.3)		4.7	(P. 760.)
Defendants	do	18		(88.9)		11.1	
Police examinations (total, 7,622):							
Michigan, (1951)	Trovillo, 1951	774	50			1.9	Verified reports apply only to those who were judged guilty and also confessed; indeterminable goup ranges up to about 80 percent (my estimate), when innocent judgments are included (Trovillo, 1951, p. 758). These data also appear in Trovillo (1943, p. 342).
Texas (1951)	do	395	62			12.4	
St. Louis (1951)	do	815	50			9.8	
Detroit (1945–51)	do	3,200				12.0	
Toledo (1951)	do	412	64.5			4.0	
Seattle (1951)	do	175			2.3	5.0	
Illinois (1951)	do	245	75				
Dallas (1951)	do	479	67			2.0	
Chicago (1938–41)	do	1,127	85		2.0	20.0	
Criminal suspects	Lee, 1953	1,127	(97.95)		2.05		Same data when given by Trovillo in 1943 includes 20 percent indefinite reports; 2 percent of those reported innocent later found guilty and 0.05 percent of those reported guilty later found innocent (p. 127). Trovillo does not claim 97.95 percent accuracy; Lee does. On p. 17, Lee says "only 12 mistakes in judgment in 2,171 cases;" perhaps "2,171" is printer's error for "1,127" above.
Do	Inbau and Reid, 1953	4,280	95.6 (36.4) 11.7	(79.0)	.0007 (.07)	4.4	"Accuracy" here is number of cases tested minus those cases reported indefinite. Inbau's value of 0.0007 percent "proven error" is an arithmetic error; it should be 0.07 percent.

[1] About 50.
[2] "High."
[3] Several cases.
[4] 1 case.
[5] Over 300. In a private communication, Kubis says that the number of cases given in the article is a typographical error; it should be 300 and not 500.

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Some reports (e.g., Luria, Summers, Kubis) make a claim for high accuracy but offer no quantitative data. Kubis (1950) finds "no errors of diagnosis . . . (but the) 'no decision' category was rather large," i.e., 10 percent.

The report of Inbau and Reid (1953, p. 111) deserves a special comment. They determine accuracy as 95.6 percent by adding all instances in which examiners made judgments of guilt (31.1 percent) or of innocence (64.5 percent). In the remaining 4.4 percent of cases, the examiner could not make a conclusive judgment. They report no indeterminable cases. They report proved error in 0.0007 percent of the cases but this is an arithmetic mistake; using their own data (3 errors in 4,280 cases), this value should be 0.07 percent. Also, according to their data, there were confessions in 486 out of 1,334 reports of guilt; thus, verification of guilt was possible in 36.4 percent of the cases. In 323 out of 2,759 reports of innocence, another's confession confirmed the judgment; thus, verification of innocence was possible in 11.7 percent of the cases. Finally, note Kubis' (1950) report that in order to achieve zero errors of diagnosis, he had to accept 10 percent in the "no decision" category. This contrasts with Inbau's 4.4 percent.

However, the outstanding difficulty in interpreting the data in table 3 lies in the fact that, due to the circumstances of criminal work, the examiner often has independent knowledge; that is, not collected by means of the polygraph, which suggests whether or not the suspect is guilty. Therefore, his judgment of guilt (or innocence) is based to some unknown extent on a combination of polygraph responses *and* other information, and not on the polygraph investigation alone. It is never clear whether the judgment said to be made from the polygraph record was made before or after a confession was received. This makes it most difficult to assess the true accuracy of the polygraph when it would alone provide the information from which a judgment must be drawn.

(2) *Experimental investigations*

The advantage of laboratory studies of lie detection is that more complete control of the means of (and the reason for) collecting data is generally possible and, therefore, such data can be subjected to rigorous statistical analysis. The basic disadvantage of laboratory studies is that they may not be relevant to lie detection if they do not evoke "real" emotional responses of fear and anxiety similar to those present in real life, polygraph examinations. The latter contention is often made by lie detection experts, on the ground that less emotion can be aroused in the laboratory and that therefore the polygraph would show a lesser ability to detect deception under such circumstances. For example, Trovillo (1953) says:

"Simulated emotion in psychology classes, or the lecture platform, in drama, and in experimental laboratories has done more to clutter up and confuse honest polygraph reporting than all the quackery of 50 years" (p. 747).

"Much of the academic experimental validation of polygraphic technique is completely barren of significance. No matter how accurate and reliable the instruments used, if the controls used do not guarantee that *fear* is being measured, then all conclusions are not only irrelevant but hazardous. Future progress depends on use of experimental subjects experiencing drastic stress: the criminal suspect, not the laboratory liar; the mental patient, not the academic spoofer" (p. 762).

"The professor who buries his nose in textbooks and bores his students with myopic dronings over verbal autopsies will never be interested in conducting vital research in lie detection" (p. 762).

The results of laboratory studies, as shown in table 4, do not justify any antipathy toward experimentation on the polygraph. These studies show that polygraph judgments about deception in the laboratory are correct in about 70 to 100 percent of the cases; the median value in the table is about 92 percent. This is the range of values reported in "real life" investigations. Some recent studies, such as those of Lykken (1959, 1960), Kubis (1962), Marcuse (1946), and Baeson (1948) are well controlled and show that the polygraph can be used to detect deception (of the type which can be arranged to permit experimentation) by objective criteria in 90 percent or more of the cases. It is significant that accuracy increases when the examiner is prepared to report that some polygraph records are inconclusive, i.e., do not permit him to make a determination. Surprisingly in these studies few proved errors are reported. There may be a minority of people (perhaps 10 percent) on whom the polygraph may not work. If judgments of deception are required for such people, other means than the polygraph must be employed. Experimental data do not provide a blanket argument against the polygraph though they do remind us that the polygraph cannot deal with all cases.

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TABLE 4.—*Accuracy of polygraph reported in experimental studies*

Type of investigation	Reference	Number of cases	Accuracy (percent)				Comments
			Verified reports	Indeterminable cases	Proved error	Inconclusive polygraph	
Noncriminals	Marston, 1921	35	94.2				
Do	Ruckmick, 1936		86.0				
Students	Summers, 1939	50	98.0				
		221	99.1				
Experimental cases	MacNitt, 1942	194	99.0				Emphasis placed on GSR and cardiac amplitude; accuracy not defined.
Imaginary crimes	do	17	99.0				
Card tests	do	36	75.0				
Innocent students	Bitterman and Marcuse, 1947.	81					81 college men, all judged innocent of a dormitory theft; after 1–5 retests Cardiovascular responses categorized on 1st test only: No reaction 38 Moderate, scattered 28 Extensive 25 More pronounced to relevant than irrelevant, i.e., guilty 9 Total 100 Agreement between 3 judges in categorizing responses 0 87 to 0.96 (cont. coef.).
Distinguish guilt from knowledge about the "crime" in a mock theft.	Baeson, Chung, and Yang, 1948.	100	86.0				In 75 percent of cases, guilty person in each pair (rather than person with guilty knowledge) produced evidence required for identification.
Mock theft	Rouke and Kubis, 1948	(1)	97.0				1 or 2 trials insufficient but accuracy can reach 97 percent if many retests are permitted; no difference in polygraph response between delinquents and nondelinquents.
Card guessing	van Buskiirk and Marcuse, 1954.	50	72.0–84.0				Errors could be reduced 50 percent and accuracy would rise to 92 percent if more indeterminate judgments made; but those on whom polygraph could be used would drop from 100 to 72 percent (for this sample). Reliability: Records could be read in same way 1 month later in 84 to 94 percent of cases.

See footnote at end of table.

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TABLE 4.—*Accuracy of polygraph reported in experimental studies*—Continued

Type of investigation	Reference	Number of cases	Accuracy (percent)				Comments
			Verified reports	Indeterminable cases	Proved error	Inconclusive polygraph	
Mock crimes	Lykken, 1959	49	90.0–94.0				GSR only used objectively in guilty knowledge proceedure; 100 percent innocents correctly identified, 88 percent guilty correctly identified.
Faking	Lykken, 1960	20	100.0				GSR only used objectively in guilty knowledge technique.
Simulated theft	Kubis, 1962	336	73.0–92.0				Used objective judgments of examiners who did not know whether subject was guilty or innocent.
Denial of actual crime by ex-prisoners in an experiment.	do	23					Examiner's problem was to judge nature of crime.[2]
Test	do		40.0				
Retest	do		29.0				
Deliberate attempts to beat the polygraph in guessing a number.	do	20					Accuracy dropped from 75 to 80 percent in control session to as low as 10 percent in experimental session.

[1] 80 delinquents; 90 nondelinquents.
[2] Described more fully on p. 447.

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(3) *Methodological studies*

Under this heading, we wish to review several experiments in which the polygraph or some of its component indicators was used, not always for the purpose of lie detection. In general, these studies show that the polygraph is a sensitive instrument so much so that the responses it measures can be affected by a variety of influences. Therefore, adequate controls are required before the polygraph can be used as an effective instrument. For example:

(*a*) Greater GSR responses were observed in 40 college students when a Negro rather than a white examiner operated the GSR instrument. Rankin and Campbell (1955).[4]

(*b*) The GSR response adapts (i.e., becomes reduced) most quickly to a light stimulus, next to a buzzer and least to a question (i.e., an idea). Demonstrated on 54 students by Kubis (1948).

(*c*) Even though electric shock was used every time the subject told the truth in an experiment where he tried to deny a number he had selected, the GSR response was not reversed. This demonstrated, on 23 students, the relative stability of objective criteria of deception and the accuracy of their identification under conditions designed to obscure the criteria and to confuse the diagnosis. Block et al. (1952).

(*d*) Innocence (of suspected criminals) can be determined objectively with greater accuracy than guilt. Only blood pressure records were used in a preliminary, feasibility study of 17 verified innocent and 33 verified guilty polygraph tracings. Leonard (1958, pp. 118–121).

(*e*) Though a sudden rise in blood pressure in response to relevant questions is generally suggestive of guilt, Arther (1955) shows four verified cases in which it occurred with innocent subjects. A "control question" technique has been devised by Inbau and Reid (1953) to avoid this possible error of interpretation.

(*f*) Polygraph experts who conducted an examination produced no more accurate judgments than did other examiners who had access only to the records of the same examination. This was accomplished in an experiment which was virtually real-life, involving a presumed disclosure of classified information. However, accuracy of both groups was not high. In the critical retest period, the examiners (those who performed the tests) were able to detect the two experimental lie situations in 41 percent of the cases; one of the two lies in 54 percent of the cases; and neither lie in 5 percent of the cases. The corresponding average percentages for raters (having access only to the records) were: 54 percent, 36 percent, and 10 percent. In the test session immediately following, the accuracy of examiners and raters dropped to a chance level. Adaptation was rapid and appreciable within the same day of testing. Kubis (1962).

(*g*) In a long series of experiments, Ellson (1952) showed that objective measures of such physiological indicators as GSR, breathing rate, breathing amplitude, breathing time, systolic pressure and diastolic pressure, when taken singly, rarely distinguish between deception and non-deception in more than about 75 percent of the cases. When these indicators are combined optimally by means of statistical discriminant functions, the accuracy rises to about 90 percent correct classification of liars in experiments. Greater accuracy is possible, but was not demonstrated in these experiments, provided that improved techniques and procedures are found to increase the statistical reliability of the individual measures.

Perhaps these studies are sufficient to indicate that the polygraph can demonstrate validity of the order of 90 percent in experimental situations. However, the polygraph test is subject to error when a variety of uncontrolled influences are present, some examples of which are offered in these studies. Greater accuracy may be anticipated by combining the results of several physiological indicators in accordance with statistical rules which reflect their predictive value, provided we can also increase the reliability of measuring these indications.[5]

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[4] A reviewer comments: An activity "has one Negro examiner. There has been no observable difference in the recorded patterns of his interviews of white subjects, compared with interviews conducted by white examiners." No data were offered to support this view, while Rankin and Campbell's data suggest that the reverse is probably true.

[5] A polygraph examiner comments: "Methodological studies, as well as much of the literature in the field have, for some reason, emphasized research and experimentation on the galvanic skin response. This is somewhat anomalous, in view of the fact that many experienced and expert examiners place little or not credence in the galvanic skin response. Some competent examiners admit frankly that they do not even turn on the

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6. The Patterning of Physiological Responses

The conventional polygraph, with its three physiological indicators, obviously can be used to detect deception more accurately than would occur by chance alone. The reported accuracies are rarely below 75 percent and sometimes approach 100 percent. Two factors which probably influence a major portion of this variability are the procedures used by the examiner and the physiological responsivity of the person being tested. Let us first consider the latter problem.

The three indicators used in the standard polygraph (breathing pattern, cardiac pattern, and GSR) measure only a few of a large number of known, autonomic response mechanisms. Measurement of autonomic responses is desirable because they are not primarily under the direct, voluntary control of the person being observed, even though some such influence is possible—more so for breathing and less so for the GSR. Activity of the autonomic nervous system can be measured by at least the following physiological responses:

- Galvanic skin response
- Breathing:
  - Pattern of response
  - Amplitude
  - Rate
  - Time
- Vascular response:
  - Systolic blood pressure
  - Diastolic blood pressure
  - Pulse rate
  - Pulse time
  - Pulse wave velocity
  - Volume pulse
- Blood volume in forefinger, leg
- Blood oxygen saturation
- Skin temperature
- Muscle tension potentials
- Hand and finger tremors
- Eye movements
- Pupil diameter
- Gastrointestinal motility
- Electroencephalograph
- Ballistocardiograph
- Salivation

This list could be extended and also replicated because there often are several ways to measure each physiological response. For example, there are at least four different ways to measure the GSR:

- Skin conductance.
- Log conductance.
- Skin resistance.
- Log resistance.

At the outset, it is important to realize that the autonomic responses are not necessarily highly correlated with each other. That is, even though all of these response mechanisms are influenced by the autonomic nervous system, the influences are not identical. Some mechanisms show large responses while others, at the very same time, show little response. Two mechanisms which show a large, initial response to an emotional stimulus may not adapt (i.e., return to their initial levels) at the same rate.

A wide range of physiological responses have been studied in connection with psychosomatic medicine, physiological correlates of personality, medical diagnosis, the measurement of anxiety states, and psychotherapy. In these areas of research, many studies may be found which clarify some of the problems encountered in the practice of lie detection.

Some investigators, such as Ax (1960), Wenger (1961), Malmo (1950), and Lacey (1958c) have measured simultaneously up to ten physiological variables and have evaluated the results in accordance with objective criteria. Methods for the simultaneous recording of up to 29 physiological processes and for automatic data reduction systems have been described by Ax (1960), Zimmer (1961), and Clark (1961).

According to Lacey (1958c), individuals exhibit idiosyncratic patterns of physiological response which tend to be repeated in various stress-evoking situations; six variables were measured. If such individual consistency is confirmed, physiological responses in emotional states would have to be interpreted on an individual, rather than on a general basis and a significant change introduced in lie detection procedures. Wenger (1961) measured eight autonomic responses in four different emotional situations. Although stable response specificity and stereotype occur to some degree, they are interpreted by Wenger as

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galvanic skin response because of the impossibility of determining the source of galvanic skin response reactions. Others use the galvanic skin response as an aid but ignore it when its excursions conflict with the pneumograph and cardiosphygmograph patterns."

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caused in part by the method of measurement and in part by significant indivual differences in the resting level of the autonomic functions. He cautions against overgeneralizing the significance and pervasiveness of autonomic response specificity and stereotypy. Few reaction patterns were identical for a subject under the four emotional conditions and this is further evidence against general interpretation of physiological responses. Using 7 responses (transmuted into 14 scores). Ax (1953, 1960b) obtained distinct but different physiological patterns for anger and fear. However, his study does not show much evidence for physiological stereotypy.

In a study concerned primarily with various techniques of quantifying autonomic responses, Dykman (1959) used the three conventional polygraph indicators on 40 medical students under conditions of rest, noise and responding to a series of emotional and non-emotional questions; lie detection, as such, was not attempted. He found:

(*a*) Skin resistance was the easiest to evaluate and the most consistent of the three measures.

(*b*) The autonomic responses diminish rapidly to a relatively constant level for each series of stimuli.

(*c*) Subjects are more reactive in skin resistance than in heart rate or respiratory rate, both in terms of the magnitude and frequency of response.

(*d*) The magnitude of autonomic response is dependent on the initial level of functioning; in general, the higher the initial level, the smaller the response.

(*e*) An individual's reaction in one autonomic subsystem cannot be predicted from his reaction in another.

These few studies, from among a large literature, show that a simple or purely mechanical treatment of the three polygraph indicators would lead to a low accuracy of lie detection. Polygraph operators deal with this situation in an intuitive manner, shifting from one indicator to another, in an unknown fashion, in order to analyze a record. Various "schools" of interpretation have developed in which the examiner emphasizes one of the three indicators to the relative exclusion of the others; each indicator is regarded by some examiner as the single, "best" indicator.[6]

Since, as a result of learning processes, individuals undoubtedly differ in the choice of response mechanism and degree of responsivity to emotional stimuli, there is an ample basis for various examiners to build up confidence in their own methods of analysis. But since intuitive, rather than objective, rules play a large role in the evaluation of records, the idiosyncracies of various operators undoubtedly contaminate the accuracy of the results. This may not be a problem for cases which are straightforward and routine but it must limit accuracy for the cases which are ambiguous or difficult to interpret.

A striking example is the "Total Chart Minutes" concept developed and copyrighted (1960) by Cleve Backster, director of the National Training Center of Lie Detection, New York, N.Y. The term "total chart minutes" refers to the accumulation of time during which a subject has been asked questions during one or more trials on the polygraph; i.e., the time between trials is excluded. The useful purpose served by this concept is that it attempts to account for the value found by some examiners for a preferred indicator as due to the phase of interrogation during which that indicator may be especially discriminating. A series of curves is provided which describes the relative effectiveness (from "excellent" to "poor") of the three standard tracings (breathing, heart, GSR) for a "probably innocent" or a "probably guilty" person for any period with the total chart minutes structure. No data are provided to verify the schematic curves; in fact, when asked for confirmation of this intriguing concept, Backster could (or would) not provide any corroborating data to support his thesis.

It becomes clear that in real life we cannot rely solely on the individual interpretation of an examiner without verification by independent means, such as another, completely independent evaluation by another examiner, or a background investigation, or both. The addition of independent data must increase the degree of confidence we can place in the final result. Thus, there is an urgent need for (*a*) multivariate recording in actual interrogations, (*b*) independent

[6] One polygraph examiner comments: "Granted that intuition may play a part in the analysis, but the analysis is more probably a Gestalt process, into which a great deal of experience on the part of the examiner is compounded." This reviewer noted that some examiners disregard the GSR.

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judgments by more than one examiner, and (*c*) automatic data processing of these complex records.

We might, now, consider the implication of these studies for improving our ability to detect deception with the polygraph assuming, for this purpose, that adequate transducers and methods of measurement exist or can be devised. Although activity of the autonomic nervous system may be observed in many ways, the addition of new measures would not necessarily increase the accuracy of detecting deception. The value of additional measures depends upon the way in which deception affects various physiological processes. Assuming that the three present indicators do not adequately sample the physiological expressions of deception, it would make sense to add new response measures which fill this gap. Our knowledge on this point is slight. An estimate that the polygraph-and-examiner has a high accuracy (e.g., about 90 percent) does not provide an estimate of the variance due to each of the three polygraph responses alone or in combination or to the examiner. Therefore, we do not know whether there is room for improvement in the instrument or in the responses which are measured.

Current technology permits us to examine the value of observing the three current response mechanisms as well as the possible value of adding new ones. The essential device which has not been available previously is automatic data processing equipment. Ellson (1952, pp. 150–161) proposes that several indicators should be combined by means of discriminant functions to provide a more powerful indicator but points out that our ability to improve detection of deception will be limited by the reliability of the individual measures. The use of a computer to combine these variables for lie detection has been suggested by Zimmer (1961) who has assembled equipment for such an experiment but no results are available as yet. The work of Ax, Lacey, and Wenger, mentioned above, could readily be extended into the area of lie detection.

The many autonomic responses which may be added to lie detection are listed earlier in this report but they must be chosen so that only the more diagnostic ones are used. The three variables in current use will probably remain highly useful. Promising ones to consider are blood volume in finger, muscle tension, skin temperature, eye motion and electroencephalograph, the last if additional research clarifies the meaning of the phase changes. Initial studies involving multiple sensors would have to be accomplished in a laboratory setting with possible cumbersome equipment. However, great advances have been made recently in improving sensors and in reducing their size for use in hospitals, medical experimentation and the bioastronautics program and there is no reason to doubt that the necessary equipment can be made more convenient to use. This applies also to reduction in the size of any computing equipment that might be developed to perform on-line data processing of physiological indications but further speculation in this direction is premature. It is clear that the patterning of physiological responses in lie detection is an area in which additional research can be accomplished readily by taking advantage of existing techniques which have not, as yet, been applied to lie detection.

7. Current Research on Lie Detection

An organized research program to improve lie detection does not exist at the present time in the Government though scattered support, at the rate of about $100,000 per year, may be identified. Within this small budget, more funds are devoted to the improvement of equipment than to basic or applied research. Some topics enjoy interest but no financial support. Finally, we will note briefly the existence of useful work in related areas.

A. GOVERNMENT-SUPPORTED RESEARCH

Government-supported research on lie detection is directed primarily toward improving existing instrumentation and developing a few sensors and transducers. A small effort is directed toward developing new procedures. The following listing is believed to represent the entire effort:

(1) Miniaturized polygraph

A prototype, transistorized polygraph weighing about 10 pounds will soon be available for evaluation. (Associated Research, Inc., already markets a 21-pound polygraph instrument which operates on four flashlight batteries and fits in an attaché case. C. H. Stoelting Co. has developed a 12-pound instrument which operates on 110-volt a.c. current.) Current "portable" equipment weighs up to 40 pounds.

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On the new equipment, the breathing pattern will be sensed by a strain gage and cable tied around the chest rather than by a pneumograph. Blood pressure changes will be sensed by a piezo-electric crystal on the wrist rather than by the cardio-sphygmomanometer. Conventional GSR sensing is retained. This polygraph will produce a record very similar to the present one and its primary utility, in contrast to other equipment, will be its ease of portability.

(2) *Rapid computer processing of involuntary responses*

The Air Force Office of Scientific Research is supporting a project for rapid and accurate evaluation of psychophysiological responses by means of computer analysis.[7] The purpose of the study is to devise methods which will provide an interviewer with reliable indications of the kind of information carried by the person being intreviewed. Nine involuntary reactions will be studed:

Muscle action potential voltage.
Intersystole time.
Finger pulse amplitude.
Respiration cycle duration and amplitude.
Skin resistance.
Skin temperature.
Body-weight shifts.
Reaction time.

The equipment required by this project has been assembled and is being checked out; up to now, no data have been collected. This project has been referred to, erroneously, of course, as one in which a "red light tells when the subject is lying."

* * * * * * *

(4) *Lie detection methodology*

Dr. Joseph Kubis (1962) [8] of Fordham University is conducting a series of studies to improve the methodology of lie detection also on project 5534. * * *. The study consists of four parts, some of which have been described earlier in this report. The following summary is based on a conference with Dr. Kubis at RADC on January 2, 1962, and represents his preliminary conclusions:

(*a*) Sham theft (360 subjects, 5 examiners):

Examiners can correctly detect "innocent" or "guilty" students in 73 to 92 percent of the cases. Raters who worked only with polygraph charts (and did not see the "suspects") were as accurate as the examiners who performed the interrogations. In 112 sessions, 2 "innocent" students were called "guilty."

Of the three measures used by Kubis, the GSR response provided by far the greatest accuracy (about 90 percent for discriminating the "guilty" from "innocents"), while the other two indices (respiratory and plethysmographic) produced accuracies of only about 60 to 70 percent.

When discriminant functions are calculated based on the ratings of different individuals analyzing the same data, they are found to differ appreciably in the assignments of weights to the three response indices. This lack of homogeneity among various discriminant functions suggests inherent difficulties for the development of computer techniques to provide objective indications of guilt or innocence.

However, considering the low objectivity realized by visual interpretation of respiratory and plethysmographic responses, computer techniques may well be a valuable adjunct to lie detection in the following respects:

(i) Differentiating among complex physiological patterns.
(ii) Developing new indexes or criteria of deception.

(*b*) Denial of a previously committed crime by ex-criminals on parole (23 cases): Since all subjects were known to be guilty, the experiment consisted of judging the type of crime committed. The subjects were told to deny a specific previous crime and each record contained two "lies." In 40 percent of the cases, the examiner was able to detect both lies in the records of the ex-prisoners; in 48 percent of the cases one of the two lies; and in 12 percent of the cases neither of the two lies. In a retest of the same subjects, 29 percent were detected in both lies, 57 percent in one of the two lies, and 13 percent in neither of the two lies. (Based on averages of 3 examiners.)

[7] Grant AF–AFOSR 62–110 with the University of Georgia; the principal investigator is Herbert Zimmer.
[8] Dr. Kubis' final report, noted in the bibliography, became available while this report was being printed.

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(*c*) "Leak" of classified information: An attempt was made to conduct a "leak of classified information" experiment but this proved to be impracticable to perform. Although this would have closely approximated a "real life" situation, Kubis had to substitute for it a situation wherein the subjects denied knowledgeability of selected items of classified information.

(*d*) Countermeasure experiment: Subjects were trained to use several techniques to make it difficult for an examiner to interpret a polygraph record. The test required the examiner to guess a number on a card selected by the subject. The prescribed techniques and instructions were:

(i) Yoga: "Keep your mind as blank as possible and answer 'No' to all questions."

(ii) Muscle tension: "When some questions are asked, tense your body or foot so that the examiner doesn't see it and in a way that will mislead him as to the number you have in mind."

(iii) Exciting imagery: "Think of something that is exciting to you, in a manner that will make it hard for the examiner to guess what number you have in mind."

Preliminary results for 20 subjects show about the following accuracy:

	Accuracy (percent)
Control (no instruction)	75–80
Yoga	75–80
Muscle tension	10–20
Exciting imagery	15–25

If a subject selected a decoy number on which he consistently tensed or used exciting imagery, he could direct the examiner to this number in 55 to 70 percent of the cases. Examiners are unable to distinguish among the known decoy and "real" numbers on the basis of the polygraph records. Though this was only a preliminary experiment, it is sufficient to show that it is possible to interfere with a polygraph. It is not clear whether an alert examiner could ascertain that the subject was trying to create a spurious response.

(*5*) *Instrumentation and transducers*

The work of Dr. David McK. Rioch at the Walter Reed Army Institute of Research, Washington, D.C., includes a continuing program for the development of new physiological sensors and transducers for research in the broad area of neuropsychiatry. And any new developments in psychiatric interview procedures, sensors, transducers or physiological recording, could be applied to improve lie detection.

* * * * * * *

(7) *Staff studies*

The Department of the Army[9] is conducting a staff study to determine and recommend policies governing U. S. Army use of the polygraph for counterintelligence and security purposes. The method of study consists of a questionnaire and interviews directed to polygraph examiners. Results are not yet available.

The Office of the Provost Marshal General is modifying the monthly reporting procedure on polygraph examinations conducted in the Army to provide more detailed, statistical information.[10]

The Provost Marshal General's School is conducting research into the effect of hypnosis on interrogation. A preliminary report is that a post hypnotic suggestion can lead suggestible subjects to "forget" particular incidents.

B. PROPOSED RESEARCH

The research proposed below represents areas in which polygraph examiners have expressed interest. However, at the time this report was written, no formal projects had been established to perform these studies.

[9] Project title "U. S. Army Use of Polygraph for Counterintelligence and Security Purposes" (U), ACSI–SC, June 8, 1961. The project officer is Maj. Uldrich H. Pettine, G–3, USA Intelligence Center, Fort Holabird, Md.

[10] Operations Branch, Office of the Provost Marshal General, Department of the Army. The project officer is Lt. Col. Nicholas P. Rudziak.

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(2) *New sensing devices*

A variety of new sensors, such as those listed below, have been proposed to extend the capability of the polygraph:

(*a*) Infrared sensing devices for remote measurements of skin temperature.

(*b*) Devices to measure breathing pattern and heart rate based upon sensitive microphones, ultrasonic or radar-type equipment.

(*c*) Electro-encephalograph: A helmet mounted device with 100 sensing elements; with computer processing, this would produce an intensity modulated display of brain activity, called a toposcope. * * *

(*d*) Thermistors to measure skin temperature.

(*e*) Strain gage on face or jaw to measure muscle tension.

(*f*) Improved blood pressure measuring devices:

(1) Strain gages and an EKG lead (HRB-Singer).

(2) Carbon microphone attached to finger tip (Texas Instruments).

(3) Oximeter-type device attached to ear lobe.

Among these, it will be noted, are some new sensors and some which do not have to be attached to the body. Background research to explore the possible value of new sensors for lie detection is rarely considered because their novelty is taken as *a priori* evidence of utility. In the case of new * * * sensors, it will still be necessary to demonstrate that the new physiological responses being measured actually correlate with attempts at deception.

C. RESEARCH IN RELATED FIELDS

Research of great potential value to lie detection is being accomplished in closely related fields, such as bioastronautics and medicine. No attempt will be made to summarize these efforts though the existence of several important areas will be noted.

There has been a need to monitor the physiological status of astronauts in space flight and in the experimental program associated with it, e.g., high altitude chambers, human centrifuges, protective clothing, etc. This has led to the development of new, reliable and miniaturized sensors for such responses as the cardiac pattern (EKG), blood pressure, breathing, and body temperature. Because of the need to telemeter the data from the spacecraft to ground observers, means have been developed for digitalizing the data, transmitting it to a remote receiver, and processing it automatically so that it can be read and interpreted in real time by observers on the surface of the earth. Though telemetering such data is not an obvious requirement for lie detection purposes, it provides the means (with miniaturized equipment) to conduct an interrogation under circumstances where it is desired to have the subject unencumbered with wires which restrict his movements.

There is also great current interest in using high-speed computers for better understanding of physiological, neurological, and biochemical processes. Computers make it possible to observe simultaneously many of the complex responses of the organism and to identify the significant parameters of these responses, either alone or in combination. For example, H. V. Pipberger (Mount Alto VA Hospital, Washington, D.C.) has demonstrated that 99 percent of routine electrocardiograms can be diagnosed correctly by computerized data processing equipment. The National Institutes of Health provide about $18 million in fiscal year 1963 for medical computer facilities; the estimated amount is $68 million for fiscal year 1964. Thus, means are now at hand to investigate many complex physiological processes on an ongoing, real time basis. This technological capability can readily be applied to improve our knowledge of lie detection by rigorous, systematic study.

8. CONTRAINDICATIONS AND COUNTERMEASURES

The emotional reactions of a person in response to certain but not all questions depend largely upon the rules of behavior being followed by the person. When there are clear, cultural distinctions between right (or truth) and wrong (or lie) attached to each answer (and assuming that the point of the question is understood equally by the interrogator and the subject), the polygraph should prove a valid instrument for most people. It is, therefore, useful to recognize that there may be several situations in which the polygraph could fail:

(*a*) When the subject lacks appreciation of the difference between truth and falsity. A habituated liar (or severely disturbed personality) should not be expected to show (or indeed, "feel") emotions due to fear of detection.

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(*b*) When there are differences in the behavioral codes of the subject and interrogator. Such differences may separate people in different cultures, or people of different social (or political) status in the same culture.

(*c*) When the subject attempts to "beat" the polygraph by controlling his breathing or cardiac response, by suppressing his memory, or by feigning a mental attitude, with or without the benefit of training, to produce such effects.

(*d*) When the subject has used drugs and, possibly, hypnosis to modify his physiological responsivity.

With such possibilities in mind, a polygraph examination can lead to three undesirable results:

(*a*) False positives: In which it is concluded that a person is attempting deception, when this is not the case.

(*b*) False negatives: In which it is concluded that a person is not attempting deception, when this is not the case.

(*c*) Indeterminate: When the examiner recognizes that he cannot make a reliable judgment about deception or truthfulness.

Among these three categories, indeterminate results need not confuse the examiner because he knows that some additional step, such as a reexamination or a more careful background investigation, must be taken to resolve the uncertainty. Overall accuracy should be increased when the examiner is free to employ the indeterminate category, although this obviously produces fewer resolved cases.

Kubis (1950) achieved a confirmed accuracy of about 90 percent but also made 10 percent inconclusive judgments, a larger fraction than is generally reported. Lee (1953) reports 98 percent accuracy and no inconclusive determinations, while Inbau and Reid (1953) report 95.6 percent accuracy and 4.4 percent inconclusive determinations. Although there are little data to document the errors that actually occur in lie detection, there appear to be some false positives (about 2 percent according to Trovillo (1951) and Lee (1953) and fewer false negatives (but no data appear on this point). In terms of crime, it is believed that some guilty might escape but very few innocents would be punished.

(*1*) *Contraindications to use of the polygraph*

Lie detection experts[12] point out that a polygraph examination should not be conducted during certain transient states of a individual, such as, for example:

Excessive fatigue.
Prolonged interrogation.
Physical abuse.
Extreme nervous tension.
Evidence of drugs, especially tranquilizers and stimulants.
Sub shock or adrenal exhaustion.
Fear of detection of some other offense not related to this interrogation.

A similar restraint applies when long-term physical or psychological disorders are present:

Excessively high or low blood pressure.
Heart diseases.
Respiratory disorders.
Hyperthyroidism.
Mental abnormalities.
Feeblemindedness.
Psychoses.
Psychopathic personality.

Any of these conditions precludes an effective examination because it introduces into the record response characteristics which are not the result of the examination itself. The professional integrity of the examiner would require him to refuse to examine individuals in whom such conditions are known to be present because an adequate examination could not be conducted. If an examiner did not know this in advance, he might detect certain unsual characteristics in the record which could lead him to terminate the examination as inappropriate under the circumstances. Various test procedures, such as repeating a test, or the "peak of tension" technique are intended to guide and alert the examiner to such effects. One obvious difficulty is that some of these conditions are not readily apparent (e.g., psychopathic personality or presence of drugs) or may not be known at the time of the interrogation. Another is that some interrogators believe they can handle every kind of case (they use the phrase "break

[12] Inbau and Reid (1953), pp. 64–99; Lee (1953), pp. 126–132.

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a case"). Restraint in recognition of one's ignorance about the possible presence of such conditions depends, ultimately, on the professional standards and integrity of the examiner since no control exerted outside the examination room can ever be entirely effective.

(2) *Can one beat the polygraph?*

If the aforementioned conditions represent natural limitations to the accuracy of the polygraph, we may now consider whether it is possible to fool a polygraph examiner. The machine itself cannot be fooled because it simply records a pattern of responses to a series of questions while it is the examiner who interprets their meaning. What, then, can a person do deliberately to avoid the appearance of deception or to mislead an examiner? What follows consists of a series of conjectures and the preliminary results of one experiment.

The experiment which deals with this question was performed by Kubis (1962) and has been described above. Though only preliminary data are available, they show that by tensing the muscles of the feet or by use of self-exciting images, test subjects could drop the accuracy of examiners in guessing a number from 75 to 80 percent to 20 percent. In 55 to 70 percent of the cases, it was possible to direct the attention of the examiner to a decoy number instead of the previously selected number.

Experiments on human conditioning add a significant note. In a recent review entitled "Does the Heart Learn?" Shearn (1961) concludes that both the form of the electrocardiograph cycle and the heart rate may be conditioned in accordance with classical rules. The technique is illustrated by an experiment of Petrova:

"An auditory stimulus (whistle) was combined with intravenous injections of nitroglycerin. Because the act of injecting the fluid would act as a conditioned stimulus, its effect was extinguished with repeated intravenous injections of normal saline. The whistle, on the other hand, was always sounded after the nitroglycerin had been injected (but before the effect of the drug was manifest). After about 100 pairings of the whistle and nitroglycerin, the whistle presented alone produced changes typical of those elicited by the drug (accelerated heart rate, decrease in QRS voltage, and augmented P and T waves)" (p. 452).

It is known that alterations in the breathing cycle can affect the cardiac response, thereby providing a means of conditioning the heart without intermediary use of some drug (Huttenlocher and Westcott, 1957). Preliminary experiments suggest that a person can learn to alter his GSR with the aid of a meter which permits him to observe the magnitude of his responses. There is no doubt that the EEG can be modified by means of conditioning (Ellingson, 1956). Gerard (1951) reports that alpha waves of the EEG, which normally disappear when a bright light shines on the eye, do not disappear when the observer deliberately pays no attention to the light. However, these facts do not imply that the EEG could be manipulated with the dexterity required to accomplish deception; not enough is yet known about the value of the EEG for use in the polygraph. Polygraph examiners know that a person who moves and squirms during an interrogation can alter the responses shown on the record; this effect would influence the interpretation of the over-all record if it could be accomplished systematically without the examiner's knowledge.

It is possible that a person could be taught through a series of carefully arranged conditioning experiments to bring some of his autonomic responses under his direct control. Lacey (1958c) has demonstrated that each person uses his body in a unique way to express his own emotional responses; this is the result of normal training and maturation. Kubis (1962) has demonstrated that autonomic responses can be influenced through simple instruction without formal conditioning. There can be no doubt that same degree of manipulation is possible; however, in order to accomplish deception, a person would have to learn to suppress or to excite his physiological responses in a pattern adequate for his purposes.

In recognizing the feasibility of such an attempt, we do not know whether training could be accomplished with sufficient elegance to become a useful device for an enemy agent. One method would be to learn to deaden all responses, so that no pattern would be discernible in response to significant or nonsignificant items; another method would be to overrespond to all items with similar effect. Though an examiner might be led to make an indeterminate conclusion in such cases, he might also be alerted to this unusual circumstance. It would be much more effective if a person could deliberately react to nonsignificant items and deaden his response to significant items; but in this case, he would also have to

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know what type of response to each question would be most likely to create an impression of knowledge or lack of knowledge about the events of interest to the interrogation.

Since the control of autonomic responses must be regarded as feasible, research is required to explore its implications for our lie detection technology. The examiner will not be helpless because new indicators can be added to the polygraph system to observe response systems which may not have been trained. Since enemy agents would also learn about new indicators, this could lead to a cycle where it may become necessary to add still newer indicators and drop older ones from time to time. But before proceeding that far, it is useful to know the extent to which training is possible, whether the current indicators are sufficiently sensitive to remain effective despite training and, then, what additional indicators are most likely to provide useful adjunct information.

It is also of interest to know if drugs or hypnosis can be used to influence a polygraph examination, both from the viewpoint of the person who takes an examination and from that of the examiner. Fortunately, the effects of drugs and hypnosis on interrogation have been reviewed recently on behalf of the Air Force and are described in an excellent book (Biderman and Zimmer (1961)).

A person about to be examined on a polygraph could take a drug, perhaps a tranquilizer, to moderate his responses. There is a danger to him in that the action of the drug is not selective—it would affect many of his responses. A flat record is unusual and tends to attract the examiner's attention; the presence of depressed responses suggests that a drug may have been used. The use of a drug, if suspected, is easily circumvented by detaining a person for a retest after the drug effects have worn off, and prolonged examination and retest is the rule in any nonroutine polygraph interrogation.

Gottschalk [13] says:

"There is a possibility that tranquilizers could be used by an examiner with selected personnel who are highly agitated and disturbed, and who might give information they prefer to withhold in return for the tranquillity they experience with such a sedative. Under the influence of this drug, the less emotionally upset informant might find that he can better master his anxieties and keep his resolve to remain silent. These are all speculations which require testing and experimentation. . . .

"The popular meaning of being 'drugged' or 'doped' implies that an individual in this state has lost control over his actions and that society will not hold him responsible for them. When the transmittal of information is likely to induce guilt in the source, the interviewer can forestall some of this reaction by the administration of a placebo or drug. In some cases, this will be all that is required to remove the barrier to information transmittal. In the avoidance-conflict between the source's guilt over yielding information and his anxieties over the possible consequences of non-cooperation, the 'inescapable' power of the drug or placebo serves to justify the source's actions to himself."

Whether or not a drug facilitates the interrogator's task, its use provides some people with an acceptable excuse to reveal information and in this sense it could produce useful side effects. Though a drug, such as LSD–25, may make a person more talkative, the interrogator still has the problem of judging the reliability of the information provided through its use since such drugs are also known to incite fantasy, drowsiness, and confusion (Redlich, 1951). To sum it up, though some drugs make a person more talkative, they may also make him more suggestible and less critical, providing nonsense as well as information. There is not, unfortunately, a magic way to the truth.

Orne [14] has reviewed the use of hypnosis in interrogation and arrives at a conclusion similar to that for drugs except that even less is known about hypnosis. The possibility of inducing a trance on a resistant person is extremely doubtful. Hypnosis requires a trustworthy relationship between the hypnotist and the subject and such a relationship does not evolve readily in an interrogation. There is a common (although probably untrue) belief that an individual in hypnosis is not responsible for his actions. If hypnosis can be established in an interrogation (this is not likely) it could, like a drug, be used to relieve a subject of responsibility for his actions and allow him to divulge information he might not otherwse yield. The idea that an enemy agent could be hypnotized to avoid giving indications of deception appears very remote. Again, a more dangerous person appears to be one who practices deception under his own control rather than one who does so with the help of drugs or hypnosis.

[13] In Biderman (1961), pp. 132–133.
[14] In Biderman (1961), pp. 169–215.

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Under AFOSR Contract AF 49(638)–728 on "Hypnosis as a Control Technique," Orne will measure autonom responses in conjunction with research on personnel control techniques for either offensive or defensive purposes; it is too early for any results to be available. Preliminary data from Fort Gordon suggests that hypnosis assists suggestible subjects to "forget" selected incidents.

Thus, there is some reason to believe that a person could be trained to introduce misleading physiological responses on the polygraph. An examiner might be able to counteract this influence by observing response indicators in which such a person may or not have been trained. Clearly, we need to know more about the possibility of such training and how to counteract it. This is equally true of drugs and hypnosis although it appears that it will be more difficult to detect the effects of training than the effects of drugs and hypnosis.

9. Russian Capability in Lie Detection

The use of lie detection equipment for security screening naturally raises the question as to whether an enemy agent could take such an examination and not be detected. If such an event occurred within the United States, its consequences could perhaps be counteracted because the polygraph provides only one source of information which could be compared with that from other sources. In screening foreign nationals, however, it is often impossible to collect any background information, in which case the polygraph provides the only data on which a judgment of attempted deception, with all its implications, can be made.

* * * * * * * *

* * * In connection with the trial of U–2 pilot Francis Gary Powers, L. N. Smirnov, Deputy Chairman of the Soviet Supreme Court, was quoted as saying that "such methods as using lie detectors and brainwashing techniques are loathesome to our legal ideals." [15] Smirnov's comment would be more credible without the remark on brainwashing.

Russian capability in technological areas closely related to lie detection is formidable and completely up to date because of their long continued interest in and research on human psychophysiological processes.

Starting with Pavlov, the Russians have studied extensively a large variety of physiological responses of the intact human organism in many different situations involving the effects of learning, drugs, surgical manipulation, and the like. Over a period of 50 years, the method of conditioning has been extended to such processes as human learning, education, social adjustment and abnormal behavior. This method of psychological research was fostered in the Soviet Union because it permitted objective and mechanistic descriptions of behavior while avoiding subjective and phenomenological explanations. This led to the development of a sophisticated technology concerning measurement of physiological processes, the autonomic nervous system and the central nervous system. The Russians have also accomplished important work on the quality and quantity of physiological response when the organism responds to new, as distinct from old, information; this is called the orienting reflex and will be discussed below.

In 1923, A. R. Luria, of the Institute of Defectology, Academy of Pedogogical Sciences, Moscow, employed muscle tremors as indicators of emotional response to judge the guilt of criminal suspects. Though his work is regarded as significant, muscle tremors have not been used subsequently in lie detection work. Luria shifted his interest from criminal interrogation to other areas many years ago. His recent interest centers on the role of speech in the regulation of normal and abnormal behavior.

E. N. Sokolov (1960), of the Academy of Pedogogical Sciences, Moscow, has extended the work of Pavlov in an area called the "orienting reflex," which he reported to an American audience in 1960. The orienting reflex is an unspecific response, common to animals and men, which occurs in the presence of any unusual stimulus, such as an increase, decrease, or qualitative change in a stimulus; it can occur on the stimulation of any sense organ. It can be observed and recorded simultaneously by such response mechanisms as the EEG in the occipital or motor region of the brain, the GSR, muscle tension, eye movement, respiration, and the like. The magnitude of these responses diminishes upon repeated presentation of the stimulus, essentially disappearing after 10 to 15 presentations.

[15] D. G. Brennan (1961), p. 356.

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The orienting response is a reaction to novel information (in the information theory sense) and not to the stimulus as such; it is not a conditioned response. Its significance to lie detection is that if a question is routine, orienting (i.e., the magnitude of physiological responses) should be minimal and rapidly disappear. If a question is novel, orienting should be strong and persistent. In other words, a truthful response should result in a minimal orienting reflex. A falsification requires decision, choice of words, a judgment designed for self protection and, in this case, the orienting reflex should be prominent and reinforced.

In summary, the U.S.S.R. must be regarded as highly qualified in the technology of lie detection, at least equal to that of the United States and Soviet scientists are fully competent to accomplish in this area anything that we can do.

10. Knowledge Detection for Arms Control and Political Purposes

An unusual proposal to use lie detection as a means of inspecting an arms control agreement was first made in January 1956 by Lewis C. Bohn (1960, 1961) in a RAND memorandum; in later versions, he calls this idea "knowledge detection." Another suggestion, called "truth detection" has been made by Gerard (1961) that the polygraph technique be used to demonstrate truthful intent in international political affairs:

"The proposal is simply this: all key men, speaking officially for their country in private negotiations or public addresses, subject themselves to lie, or better, truth detection procedures administered by technicians from an opposing country or from the UN. More positively, when a statesman wished to convince the world that he was making a true statement he would subject himself to truth detection."

Both of these ideas assume that additional knowledge about the polygraph would increase our willingness to use it for purposes beyond those of conventional interrogation. Bohn recognizes that the accuracy of lie detection is not known and that claims for its validity may be suspect. Bohn and Gerard believe that a carefully designed, full-scale research program is desirable because it may improve the reliability of the lie detection procedure, reduce the need for subjective judgment in interpreting the results, and increase our understanding of the underlying physiological and cultural processes which influence its accuracy.

The remainder of this section is concerned solely with the application of lie detection to arms control inspection because of its possible military value. It is important to know the true reliability and validity of the lie detection method; while higher values are desirable, the actual values are not critical except that they would influence the number of people who would have to be interrogated to achieve any desired level of statistical confidence and, naturally, establish an upper bound to the value of this method.

American participation in an arms control agreement with the U.S.S.R. requires reliable assurance that no attempt is being made to violate the agreement. This assurance can be accomplished only by direct physical inspection of weapon delivery systems, fissionable materials, factories, test sites, and the like. The categories of information which are required to make an arms control agreement acceptable are described in Frisch (1961). The history of our negotiations with the Russians provides little reason to believe that they would accept on-site inspection on a scale required for reasonable assurance of compliance with an agreement. At one time they proposed a limited amount of such inspection, which we regarded as inadequate; since then their position has become even less cooperative.

Knowledge detection, assuming improved lie detection methods are feasible, provides a means around this impasse and, in certain respects, provides additional capability to the concept of inspection. Knowledge detection does not necessarily require inspectors to travel all over the U.S.S.R. Knowledge detection requires only that access be afforded to selected individuals who, by virtue of their positions as key scientists, military or political figures, would be in a position to know about current activities in such critical areas as troop movements, weapon developments, nuclear tests, and the like. Most of these people are identifiable and therefore an agreement would provide that some proportion of them could be interrogated regularly, probably on a random basis. Evidence from such interrogations that a violation may have occurred would point to the need for an on-site, physical inspection at a particular location or activity. Thus, there could be fewer physical inspections without reducing our confidence in the degree of compliance with an agreement.

Nonphysical inspection would also potentially make available a type of information beyond the capability of any physical means of inspection. This lies in the area of intent and future plans which, in general, produce limited physical

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evidence. It also affords some means of knowing about technological developments for future weapons with physical characteristics beyond the detection capability of an inspection system set up before knowledge of their existence was available; or of tests conducted at remote times and places below the sensitivity level of an existing detection system.

There are some limitations to physical inspection. It is very costly, requires some selection among all the possible events of interest, and can only respond above the threshold of those sensors which have actually been installed. On the other hand, knowledge is pervasive and is not bound by time or place.

Bohn and others [17] who have explored this idea recognize that it has advantages and disadvantages. The characteristics of a nonphysical inspection scheme would have to be evaluated carefully to determine whether it has a useful role, among many means of inspection, in providing the information necessary to assure us that possible military and political agreements are not being violated.

Knowledge detection is proposed by its supporters as an adjunct to and not a substitute for physical inspection. There are formidable questions as to whether lie detection would work when used by people of different cultures; or whether the records of key leaders would show indications of deception when they deliberately mislead foreigners in accord with their country's interest, as they see it. Finally, key leaders need not lie if provisions are made to keep them ignorant of significant developments. There is no evidence that the U.S.S.R. would find nonphysical inspection any more acceptable than physical inspection or that an agreement with them could be reached in which it was one of the means of inspection.

To some extent, the use of lie detection in search of knowledge among a group of people is a simpler problem than whether a particular individual has committed a crime. In the latter case, extremely high reliability is required. In the former, we are searching only for leads which become significant when observed in several people and which alert us that a particular type of event may have occurred and that, therefore, a particular physical inspection may become necessary. Detection of knowledge among many people lends itself, conceptually at least, to the use of standardized, pretested questions, simultaneous testing of groups of people, multiple recorder, and automated data processing.

For purpose of the present paper, however, it is sufficient to recognize that additional research in lie detection is desirable primarily for the use to which it is now put in our own military establishment. Research and development for such purposes will also provide the information required to apply lie detection to other uses that may arise in the future, of which arms control inspection is a prime example. The question as to whether or not we should consider it for such use obviously requires that we know more about the capabilities of lie detection, the problems faced in its employment with individuals in a society competitive with our own, the sampling procedures which would be required and the value of the information derived by its use in comparison with the cost of operating such a data-gathering system. These questions can only be answered by supporting additional research and development on these topics.

II. The Interview Technique in Lie Detection

One could write a treatise on lie detection by considering the interview technique to the neglect of the polygraph instrument. Lie detection requires the use of a delicately controlled interview in order to understand the instrumented responses which are obtained. The intimate combination of interview technique and polygraph technique is recognized by polygraph examiners and the key writers on lie detection. In describing the interview, attention is directed to the use of "relevant-irrelevant" type questions, "peak of tension" procedures, control questions and the need for repeating a test; there is clear concern with the importance of a well-controlled interview. Learning how to interview properly comprises a substantial portion of the training of a polygraph examiner. This probably accounts for the preference for polygraph examiners who have previously qualified as military investigators.

Prior to an examination, the examiner is supposed to prepare his questions in a form which permits only "Yes" or "No" answers. Before the polygraph is attached, it is general practice to review with the person the precise questions to be asked to make sure that they are completely understood. A polygraph examination is severely contaminated if a person does not understand the

[17] Melman (1958), pp. 38–44; Milburn et al. (1960); Bernard T. Feld in Brennan (1961), pp. 317–332; Jerome B. Weisner in Henkin (1961), pp. 112–140; Jay Orear (1961).

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questions being asked or if he is responding emotionally to embarrassing or shameful features in these questions not known to the interrogator. Every reasonable attempt must be made to reduce such extraneous influences; the meaning of the questions must be clear and obvious; the manner of the examiner must be neutral. There is no need to emphasize further the obvious significance of the interview upon the test and we may turn directly to the problems it poses as to the accuracy of the lie detection procedure.

Though the technique of an interview is an art rather than a science, certain of its aspects are amenable to standardization and evaluation and it is likely that interview techniques within a multiexaminer unit could be reasonably standardized. Nevertheless, the reliability of the interview associated with the polygraph examination has never been statistically evaluated. Yet, it is known from other studies that the reliability of interviews (agreement between different interviewers in reporting identical material) varies widely; typical values range from 40 to 80 percent (Hyman, 1954). It is entirely possible, and probably desirable, to improve the content, format of questions and the order in which questions are presented in the lie detection interview. The problem with any single question is to determine whether alone or as a consequence of the order in which it appears it presents ambiguous unclear meanings to the recipient—not to the examiner. This can only be determined by an objective method, similar to the procedure used in the development of any standardized intelligence or personality test. The method is tedious but quite straightforward. It involves collecting all the answers that may be given in response to any particular form of asking a question, including the order in which it is presented. Since ultimately only "Yes" or "No" answers are desired, the real problem is to determine what the subject had in mind with each answer. This preliminary procedure is required to assure us that all of the characteristics of the questions employed in an interview are, in fact, known. There is no evidence that this has ever been done in lie detection or that advantage has been taken of techniques that are available for dealing with this problem. This is not to deny, of course, that the importance of the interview has been recognized or that efforts have been made to improve it on an intuitive, but not an objective, basis.

A standardized lie detection interview would apply primarily to situations which permit a routine procedure, such as in interrogation based on a personal history statement. It would, in effect, provide an "optimized" interview; it would standardize the interrogation and assure us that all persons are dealt with in the same manner. It would reduce the variability due to the personal technique and competence of the examiner. It would permit comparison of an individual's responses with that of the group. It would provide a basis for training polygraph operators.

Another limitation to an interview is that the personal manner of the examiner can easily affect the outcome even if completely standard questions are used. Only anecdotal evidence is available on this point but it is obviously a matter of great importance. In psychotherapy, we know that a patient is urged to move from one therapist to another until he finds one in whom he can confide; the therapist is responsible for pointing this out if it is not otherwise obvious. Similar responsibilities concerning the mutual compatibility of the client and

Polygraph examiners acknowledge the existence of this problem and attempt to deal with it in a variety of ways, such as by supervision, attempting to "match" the examiner with the subject, observing the interview through a one-way mirror and/or over an intercom, and by encouraging an examiner to excuse himself from any interrogation in which he feels he is being ineffective. Any effort to act in accordance with such rules must be highly regarded. Here, again, the question is whether such restraints are actually adhered to in practice. Doubtless, abuses are likely to creep in when the staff are overloaded, when there is inadequate supervision or when an examiner works alone.

It would be relatively easy to determine objectively the magnitude of such influences by comparing the effectiveness of different examiners with a carefully selected sample of similar cases. An interesting idea, which is being employed on an experimental basis in psychotherapy, is to observe the emotional responses of the therapist to the patient during interviews. This notion could be adapted to research on the lie detection interview.

It would also seem highly desirable to create impartial boards of professional overseers to establish standards to guide and help the examiner as well as to assure the Government that thoroughly professional practices are being observed. It is believed that no such professional supervision and review is presently in effect anywhere in the Government.

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12. Selection and Training of Polygraph Examiners

The selection and training of polygraph examiners within the various branches of the Government proceeds along similar lines; the differences are not significant.

It is preferable, but not mandatory, that a prospective examiner be a college graduate; in some agencies, one to two years of college is acceptable. It is desirable in all agencies, and mandatory in some, that the candidate be a qualified field (or security) investigator. The ability to speak one foreign language is required for field examiners in one organization. All examiners are civilians in the Navy and military in the other services. It is highly desirable that a candidate be mature, poised, intelligent and emotionally stable but no formal measures are in effect to help screen people for these traits, such as a psychological assessment test and/or an interview with a psychiatrist. In at least one organization, an applicant's record is evaluated by a committee of senior polygraph examiners before he will be accepted for training; in another organization, the applicant is interviewed by a board of five senior examiners whose independent judgments are a basis for acceptance.

Formal training ranges from 6 to 10 weeks at full-time schools. Most curriculums appear to be derived from the Keeler Polygraph Institute and include operation of the polygraph, interrogation procedures, record interpretation, legal, medical and psychological aspects, practice, and casework.

After formal training, some effort is made to supervise the work of a novice examiner but no consistent practice is discernible. In one organization, the examiner is supervised for 18 months after schooling before he is permitted to examine a case without supervision in the field.

There is no reason to doubt that a reasonable and conscientious effort is made to select and train polygraph examiners within the limits imposed by the competition for qualified personnel and the training facilities available to military and governmental organizations. An attempt to improve the professional status and quality of this operation would afford an opportunity to review the curriculums, selection policies, training procedures, and facilities provided for this purpose. It is believed that increased support and recognition would prove helpful.

There is room for improvement by providing for psychological assessment of candidates before they are qualified. Since the examiner's manner and bearing must affect his ability to conduct an interrogation, it is surprising that an overall psychological evaluation which would include a battery of psychological tests and a psychiatric interview is not used to screen prospective examiners. An incidental value of this step would be to provide data for improving selection procedures in the future. One would initially try to select candidates with the psychological characteristics of the effective examiners and to reject the others; and confirm the effectiveness of such procedures as experience builds up. It may also be desirable to review examiners for psychological suitability every year or two after they are on the job, since changes in psychological stability are not unknown in stressful occupations.

There are also some civilian training facilities. The Keeler Polygraph Institute (Chicago) and the National Training Center of Lie Detection (New York) provide 6-week training sessions which have been attended by police trainees, Coast Guard, and a few private operators. The National Training Center sponsors 3- and 5-day work conferences for polygraph examiners which have been attended, in addition to those mentioned above, by representatives of the Armed Forces (excluding the Navy), the Treasury Department, and employees of manufacturing or sales companies. Courses are also provided at such colleges as the University of California, Washington State College, New York University, and San Jose State College (California). At one time, C. H. Stoelting, a respected manufacturer of lie detection equipment provided a 6- to 9-month correspondence course supplemented by 2 weeks of apprentice training at a police department. Several attempts to establish professional qualification standards and a certification program have led to the formation of the American Academy of Polygraph Examiners, the Board of Polygraph Examiners (now merged with the American Academy), the Academy for Scientific Interrogation, and the National Capitol Polygraph Association (organized recently in Washington, D.C.) There is no way, however, to stop anyone with $1,000 from buying a polygraph and setting himself up as an examiner in civil life.

13. General Discussion

There is a remarkable absence of objective information concerning lie detection and the polygraph. No explanation for this state of affairs appears plaus-

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ible other than a lack of appreciation for the statistical, professional, procedural and technical questions which abound in this area. Chronic shortages of personnel and a failure to assign qualified statistical and research personnel to polygraph units must have contributed to but does not explain the absence of studies on the effectiveness of lie detection programs. About 200,000 examinations have probably been performed with the polygraph, but there is not even a reliable summary of the number of tests accomplished within the Government. There is no useful residue of this experience to help identify the strong and the weak features of our present procedures or to tell us what we must do to improve them. Though there is no reason to doubt that the lie detector "works," we do not know whether the security and criminal interrogations would be just as effective as they appear to be without the polygraph device.

The experts themselves express divergent views:

> "Although the present-day instrument can assure almost 100-percent accuracy in detecting deception, the long history of constant search for improvement continues. The day is not far off when it may be said with complete accuracy: 'You can't beat the machine'" (R. W. Inman in "'Truth' The Polygraph Story," current catalog of Associated Research, Inc., producers of the Keeler Polygraph, no date).
>
> "The best advertising is our ability to get at the truth more often and more accurately than any other known method but claims of 100-percent success are an insult even to the causual intelligent observer" (Ansley & Weir, 1956, p. 2).
>
> "Among polygraph examiners, the machine itself is credited with 10 percent of the success of a polygraph interrogation; 90 percent or 95 percent of the interrogation is dependent upon the ability, sincerity, and training of the examiners using this piece of equipment" (R. W. Inman in Ansley & Weir (1956), app. II, p. 18).

The repetition of numbers which have no objective basis has created an impression of knowledge that need no longer be tolerated.

There has been more concern with the problem of conducting polygraphic interrogations than with determining whether the polygraph is a valid instrument in lie detection. Polygraph operators have had the responsibility of doing the best they know how with the facilities available to them. They have not had the opportunity or the detachment required to assess their own activities. They must, in fact, be complimented for doing a conscientious job without the support of objective evaluation, research and development provided in many other programs.

Improvement of our lie detection capability will require a coordinated research and development program and the development of professional standards in the practice of polygraphy. We will discuss these two steps below.

First, research and development in equipment and test procedures are required to improve our capability in lie detection. This research program should have the support of a technical advisory committee consisting of competent and respected scientists who are not committed professionally to the use of the polygraph device, together with liaison from the operating agencies. No conceptual problems are thought to exist in the formulation of a research program and it is believed that an expanded program will produce useful results.

No lie detection research and development program is currently in existence. The several studies which have been identified receive insufficient support (about $100,000 a year) to provide the effectiveness we require in our lie detection capability. Except for the work of Kubis and Zimmer, most of the "research" is aimed at improving various features of already existing equipment. This will not enlarge our understanding of lie detection. Work of the type performed by Kubis has been conducted on a small scale ($25,000 per year) and should be enlarged to at least $100,000 per year. This is also true of Zimmer's work on computer data processing of physiological responses to improve lie detection.

Research and development should be expanded to a level of about $500,000 per year for a period of 3 to 5 years. This will permit a significant increase in our knowedge of the physiological, behavioral and methodological problems associated with lie detection together with a modest improvement in sensors, instrumentation and experimental facilities. It would provide the basis for a judgment as to the probable utility of a computerized lie detection apparatus but not the funds for such a development. Competence and resources for conducting an expanded R. & D. program in the psychological, behavioral, and

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methodological aspects of lie detection exist in the universities and research organizations; and in industry for the development of new equipment.

However, research and development does not possess magic properties. It is not likely that a new sensor * * * or a computer program will tell us whether a person is lying. Some research must be undertaken simply to determine whether additional sensors can improve the lie detection procedure. There is a need for experiments with, perhaps, six to ten sensors to determine the contribution each physiological indicator makes, alone and in combination, to the accurate estimation of deception by objective—that is not subjective—means. This has never been done and it is a basic step in an improvement program. Another problem is to develop a series of test situations (from simple and artificial to complex and real) in which experiments on lie detection can be performed with a reasonable expectation that the conclusions will apply to real life situations. With these considerations in mind, a research and development program based on the following guidelines should be undertaken.

A. Study the taxonomy of deception to identify the various types of deception that may exist and the types of responses that might be present in interrogation situations.

B. Develop record reporting procedures which will permit a continuing assessment of the effectiveness of lie detection. Examine the possibility of using already existing records for the purpose of evaluation. The purpose of such studies should be to determine the validity of lie detection in day-to-day operations in situations of interest to the Department of Defense.

C. Determine the reliability of the current polygraph technique by comparing the results of different examiners working independently on the same real life case material.

D. Support laboratory studies in which simultaneous recordings are made of six to ten physiological indicators to determine the reliability of measurement and the relative contribution of each indicator, either alone or in combination, to the validity of lie detection. The following indicators are suggested:

Breathing pattern.
GSR.
Heart rate.
Plethysmograph.
Blood pressure:
  Systolic.
  Diastolic.
Skin temperature.
Pupillary response.
Muscle tension potentials.

This research should also examine the feasibility of on-line data processing of multiple indicators to yield a product(s) useful to guide the examiner during the interrogation.

E. Develop new equipment in support of laboratory studies:

> * * * Sensors: Because of recent developments in medical electronics and bioastronautics, many new sensors and transducers are now available to replace those in present use. The new sensors should be adapted to meet lie detection requirements in order to improve reliability of measurement and convenience of use. Some new sensors will also be required for experimental purposes involving the additional physiological indicators noted above.

F. We must study the possibility that prior conditioning, drugs, or hypnosis, could be used to introduce spurious effects into test records and the steps that should be taken to detect and counteract such influences.

G. The possibility that individuals exhibit unique patterns of autonomic response should be explored to determine whether a preliminary part of each examination could be directed to identify the indicators in which that individual is more likely to respond.

H. Interview procedures associated with use of the polygraph should be evaluated to insure that the content, form, and order in which questions are used contribute to the maximum possible extent to an effective interrogation.

I. Applied research directed toward specific applications of the polygraph (e.g., screening refugees from Cuba, East Germany, or North Vietnam, or for inspecting an arms control agreement with the U.S.S.R.) should be undertaken to identify the technological and procedural problems which must be solved in order to interrogate individuals in foreign languages, foreign cultures, different status systems, and with divergent political allegiances. There are, obviously,

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wide differences between cultures concerning the situations in which and the purposes for which deception may be attempted as well as what constitutes mutually acceptable evidence to people of different cultures that deception has, in fact, been attempted. In these studies, we should examine such problems as the development of standard questions (perhaps given by voice tape), simultaneous testing of groups of people, rapid analyses of data, simplified and transportable equipment, and the countermeasures which might be employed to interfere with such tests.

Second, there is a need to upgrade, standardize, and regulate lie detection activities throughout the Department of Defense. This should be accomplished for the Government as a whole although such a proposal is beyond the scope of this report. Professional guidance of a high order is required to assure us that lie detection is being conducted effectively, to protect the private rights of our citizens, to establish lie detection standards, to support polygraph examiners, to advise the Department of Defense on the general level of performance in this area, and to make recommendations to improve our capability when this is required.

There is a need to establish standard methods for performing polygraph examinations, data reporting, and review procedures, and for the selection, training and certification of examiners. All such standards should be promulgated in a manual of procedures for the guidance and supervision of examiners. Accomplishment of such results will require the support and assistance of polygraph examiners and scientists in the areas of medical electronics, physiology, psychology, and psychiatry, from the civil and military services, both within and outside the Government.

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* * * * * * *

EXHIBIT 26—LETTER FROM MAJ. GEN. FRED C. WEYAND, CHIEF OF LEGISLATIVE LIAISON, TO HON. JOHN E. MOSS, JUNE 11, 1964

HEADQUARTERS, DEPARTMENT OF THE ARMY,
OFFICE OF THE SECRETARY OF THE ARMY,
Washington, D.C.

Hon. JOHN E. MOSS,
Chairman, Subcommittee on Foreign Operations and Government Information, Committee on Government Operations, House of Representatives.

DEAR MR. CHAIRMAN: This letter is in reply to your inquiry of May 19, 1964, in which you requested clarification of the special circumstances surrounding the data set forth in table 2 on page 22 of the Institute for Defense Analyses study "An Assessment of Lie Detection Capability."

Your inquiry was prompted by the statement of Dr. Harold Brown, Director, Defense Research and Engineering, Department of Defense, in his letter to you of May 13, 1963, that those statistics and the footnote (on p. 21 of the same study) which refers to those statistics were developed for "a very limited special purpose," and are subject to "misunderstanding, misuse, and misapplication unless thoroughly explained" in a manner not set forth in the study.

The data in table 2 of the IDA study presents raw statistical data concerning polygraph examinations conducted by the Army during calendar year 1961. This data was derived by the Office of the Provost Marshal General from reports received from major operating commands of the Army in February 1962. The reports were gathered and the statistics constructed at the request of the Institute for Defense Analyses.

The comments and statistics contained in the second paragraph of item 3 of footnote 3 on page 21 are those of the author of the study.

Although the raw statistical data gathered by the Office of the Provost Marshal General and the percentages drawn by the author from this data indicate a degree of correlation between the results of the polygraph examinations enumerated in table 2 and corroborating information in the same cases obtained through continued investigation, standing alone the data in table 2 is considered insufficient to provide an accurate assessment of the validity of the polygraph technique.

For example, information which might bear on the validity of the polygraph results and which was developed by the investigating officer under article 32 of the Uniform Code of Military Justice, by the trial counsel, or by the defense counsel in those of the cases reflected in table 2 which were referred to courts-martial, is not included in the reports of criminal investigation compiled by the military police, from which the statistics in table 2 were drawn. Hence such information was not reflected in the statistical data the Office of the Provost Marshal General supplied to the author of the study and was not included in table 2 or in the author's comments in footnote 3 on page 21 of the study. Nor were statistics developed to determine the ultimate outcome in judicial or administrative proceedings of the cases reflected in table 2 in which deception was indicated.

It would be administratively impracticable at this time to obtain or reconstruct additional information or follow the cases enumerated in table 2 through to their final administrative or judicial disposition.

I trust this information will be of assistance to you.

Sincerely,

FRED C. WEYAND,
Major General, GS,
Chief of Legislative Liaison.

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USE OF POLYGRAPHS AS "LIE DETECTORS" BY THE FEDERAL GOVERNMENT

(Part 4—Testimony of Post Office Department Witnesses)

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE COMMITTEE ON GOVERNMENT OPERATIONS HOUSE OF REPRESENTATIVES

EIGHTY-EIGHTH CONGRESS

SECOND SESSION

MAY 13, 1964

Printed for the use of the
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USE OF POLYGRAPHS AS "LIE DETECTORS" IN THE FEDERAL GOVERNMENT

(Part 4—Testimony of Post Office Department Witnesses)

WEDNESDAY, MAY 13, 1964

HOUSE OF REPRESENTATIVES,
FOREIGN OPERATIONS AND
GOVERNMENT INFORMATION SUBCOMMITTEE
OF THE COMMITTEE ON GOVERNMENT OPERATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., pursuant to call, in room 1501–B, Longworth Office Building, Hon. John E. Moss (chairman of the subcommittee) presiding.

Present: Representatives John E. Moss, Porter Hardy, Jr., Henry S. Reuss, and George Meader.

Staff members present: Samuel J. Archibald, staff administrator; Benny L. Kass, counsel; Jack Matteson, chief investigator; and Marvin G. Weinbaum, investigator.

Mr. Moss. The subcommittee will be in order.

This morning the subcommittee, in continuing its investigation into the use of polygraphs by Federal agencies and departments, will hear from representatives of the Post Office Department, headed by Chief Inspector Montague.

Mr. Montague, I understand you have Mr. Baleiko and Mr. Brown with you.

Mr. MONTAGUE. Yes, sir.

Mr. Moss. Will all three of you testify?

Mr. MONTAGUE. Yes, sir.

Mr. Moss. Will you stand and be sworn?

Do you and each of you swear that the testimony you are about to give this subcommittee shall be the truth, the whole truth, and nothing but the truth, so help you God?

Mr. BALEIKO. Yes, sir.

Mr. MONTAGUE. Yes, sir.

Mr. BROWN. Yes, sir

Mr. Moss. Identify yourselves for the record.

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TESTIMONY OF HENRY B. MONTAGUE, CHIEF U.S. POSTAL INSPECTOR; ACCOMPANIED BY FRANCIS W. BALEIKO, POSTAL INSPECTOR, POSTAL INSPECTION SERVICE; AND MARLIN W. BROWN, DIRECTOR, MAIL LOSS AND DEPREDATION DIVISION, BUREAU OF THE CHIEF POSTAL INSPECTOR, POST OFFICE DEPARTMENT

Mr. MONTAGUE. Henry B. Montague, Chief Postal Inspector.
Mr. BALEIKO. Francis W. Baleiko, postal inspector.
Mr. BROWN. Marlin W. Brown, division head of the Chief Inspector's Bureau.
Mr. MOSS. Do any of you have a statement?
Mr. MONTAGUE. No, sir.
Mr. MOSS. Mr. Kass?
Mr. KASS. Mr. Baleiko, you said you were a postal inspector?
Mr. BALEIKO. Yes, sir.
Mr. KASS. What region?
Mr. BALEIKO. The Chicago division.
Mr. KASS. Mr. Montague, what use does the Post Office Department make of the polygraph?
Mr. MONTAGUE. We use it only in cases relating to violations of the postal laws, criminal violations.
Mr. KASS. Mr. Montague, what type of polygraphs do you have in the Post Office Department?
Mr. MONTAGUE. Presently we have six machines, two of them Deceptographs and four of them Keeler machines. The two Deceptographs are standard machines. The four Keelers are portables. They are three-phase machines.
Up until about the first of this year we had 15 machines which were 1-phase B. & W. machines.
Mr. KASS. What is a B. & W. machine?
Mr. MONTAGUE. I will defer to Mr. Baleiko on what B. & W. means.
Mr. BALEIKO. B. & W. is called a psychogalvanometer, produced by a manufacturer in Indiana.
Is there anything else you want to know?
Mr. KASS. Psychogalvanometer? Will you explain what that means for the record?
Mr. BALEIKO. That is a name that appears on the instrument. I do not know what the manufacturer implied by that term.
Mr. KASS. What does it measure?
Mr. BALEIKO. It measures variations in skin resistance, primarily.
Mr. KASS. Primarily? What else does it measure?
Mr. BALEIKO. Nothing else.
Mr. KASS. Does it measure blood pressure, pulse?
Mr. BALEIKO. No, sir.
Mr. KASS. Does it measure respiration?
Mr. BALEIKO. No, sir.
Mr. KASS. Do you have the galvanometers or GSR's or other machines in the Post Office Department now?
Mr. BALEIKO. No, sir.
Mr. KASS. Where are they?
Mr. BALEIKO. They have been disposed of in accordance with instructions issued by the Chief Inspector some time back.

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Mr. MONTAGUE. We gave instructions to our inspectors in charge that in view of the procedure which we had set up, that these machines would be disposed of in accordance with our instructions, which means that they would be turned over to a property officer, at the regional office for disposition. If they could be sold, they would be sold; otherwise, they would be disposed of as scrap.

Mr. KASS. Do you know where they are now?

Mr. MONTAGUE. We know they have been disposed of, but I don't know whether there might be still some of them around somewhere, no. I can't say that. We have had no occasion to check that.

Mr. KASS. Could you supply for the record who bought these B. & W. machines?

Mr. MONTAGUE. I didn't say they were bought. If we can determine how they were disposed of, we can supply that for the record, yes.

Mr. KASS. Would you, please?

Mr. MONTAGUE. Yes.

Mr. HARDY. You certainly ought to be able to find out what happened to the things. If they weren't disposed of, who dismantled them? This is Government property, and there ought to be some rather clear indication as to what happened to them. I don't think there ought to be any difficulty of being sure that we get for the record just exactly what did happen to them.

Mr. MONTAGUE. We can obtain that information. We will supply it for the record.

Mr. MOSS. We will hold the record at this point to receive that information.

(The information to be furnished follows:)

Six B. & W. machines had no salvage value and were disposed of as scrap in accordance with GSA and Post Office Department regulations.

Four B. & W. machines were turned over to GSA and were disposed of as follows:

One to Tennessee State Education Agency.

One to Clermont County, Ohio, Department of Health, Education, and Welfare.

One to Minnesota State Agency for Surplus Property.

One to 13th District Office of Naval Intelligence, Seattle, Wash.

Two B. & W. machines were turned over to GSA, but we have not yet been advised as to final disposal action.

Three B. & W. machines are being held pending receipt of disposal instructions from GSA.

(In instances where disposal has been or will be through GSA we will give notice to GSA as to reason for disposal by Postal Inspection Service.)

Mr. KASS. Mr. Montague, whose determination was it to dispose of the GSR's?

Mr. MONTAGUE. Mine.

Mr. KASS. It was yours?

Mr. MONTAGUE. Yes, sir.

Mr. KASS. When was this determination made?

Mr. MONTAGUE. It was made in an interval between December 1961 and December 1963. In December 1961—well, I am getting a little ahead.

I became Chief Inspector in February 1961, and there were policies to be set as far as my administration as Chief Inspector would be concerned. One of them was what to do in the area of lie detection. In late 1961 we asked Inspector Baleiko, who is one of our experienced

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operators, to look into this whole situation, to tell us whether or not we should retain the capability as far as lie detection operation is concerned, or whether we should get out of it. If we should stay in it, we wanted his recommendations as to which is the best equipment.

Based on his analysis and his recommendations, we decided that we would retain the capability, but that we would obtain six up-to-date machines, which are three-phase machines. Then we decided that instead of having an inspector trained on the use of the machine in each of our 15 divisions, that we would split the country into 6 sections for this purpose. We selected six inspectors who were then given formal training and provided with the up-to-date equipment on lie detection.

Mr. KASS. So then your decision, based on Mr. Baleiko's recommendations, took approximately 2 years, from December 1961 to December 1963. How long had you been using the B. & W. and the galvanometer prior to that time?

Mr. MONTAGUE. They were put into use in the Postal Inspection Service in late 1950.

Mr. KASS. And from late 1950 until December 1963, this was the only type of polygraph machine used in the Post Office Department?

Mr. MONTAGUE. That is correct.

Mr. KASS. Do you know how many cases were given on the B. & W. during that 13-year period?

Mr. MONTAGUE. No. We don't have statistics on that. Our report for fiscal 1963 shows that there were approximately 475 tests altogether that year.

Mr. KASS. That was only on the B. & W.?

Mr. MONTAGUE. No. That was 475 tests altogether; 338 of those were given by inspectors, and they would have been on the B. & W. machine.

Mr. KASS. What about the other 143, I think you said?

Mr. MONTAGUE. The other approximately 137 were given by outside agencies.

Mr. KASS. Could you identify these outside agencies?

Mr. MONTAGUE. I don't have the names of the agencies available here. It depends on where the case is being investigated. When it is going to be made by an outside agency, the inspector would select the best qualified man in the area and ask him if he would make the test.

Mr. KASS. The best qualified man in the area by whose determination?

Mr. MONTAGUE. Postal inspectors are professional law enforcement investigators, and as in any other profession, we know who are the qualified people to take care of certain phases of our work. We know who are the qualified people in our areas on lie detection are, whether it is another Federal agency or whether it is a local agency. The inspector knows this, and if he doesn't know it, he will get advice on it. He goes to the man selected and asks if he will conduct the test.

Also, there is another feature involved. While we show that these outside tests were made, we list them in our statistics furnished to this committee as requests, many times there was joint jurisdiction in these cases. For example, we have a robbery of a post office in a community and normally the man who committed this crime does not rob only post offices. He also robs other businesses in the community—perhaps

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a gas station, a hardware store, some other type of business. The local police are investigating those crimes and we know it. We know from the modus operandi that it is the same person. So the postal inspector and the police work together in the case. Perhaps the crimes committed against the State law are more numerous and considered to be more important than the crime that we have. In such circumstances, it would be considered that the police have a primary interest. They might decide to give a lie detector test, independent of the inspector's decision or request.

We have included such cases in our statistics.

Mr. KASS. You say normally the individual will not only rob a post office, but he may go around robbing department stores and gasoline stations?

Mr. MONTAGUE. That is correct.

Mr. KASS. How do you know this?

Mr. MONTAGUE. We know it from experience. Sometimes you have a thief who preys solely on post offices, but that is unusual. They generally also hold up or rob other places.

Mr. KASS. Mr. Montague, does the Post Office Department maintain a list of recommended polygraph operators outside of the Federal Government?

Mr. MONTAGUE. We don't maintain such a list. Our men in the area know who they are, though, from associating with them, from attending law enforcement meetings. From attending professional meetings of various types, you get this information. It is part of the profession, part of the business that you know this.

Mr. KASS. Mr. Montague, are these limited to other Federal agencies?

Mr. MONTAGUE. No.

Mr. KASS. Are these limited to State and local police agencies?

Mr. MONTAGUE. It could be State and local agencies, and it could also be a local university where they have a qualified lie detector operator or someone who teaches a course in it.

Mr. KASS. Could it also be a private polygraph examiner?

Mr. MONTAGUE. We have not gone out and engaged a private examiner to whom we had to pay a fee for any examination of this kind, to my knowledge.

Mr. KASS. But without a fee, have you also used private polygraph examiners?

Mr. MONTAGUE. I don't know of any case offhand. [Turning to Mr. Brown and Mr. Baleiko:] Do either of you know of any such case?

Mr. BROWN. Unless you would consider a professor in police science or something of that sort as a private individual.

Mr. KASS. He would have to be a private individual or he is a part of the Federal Government or the State government.

Mr. BROWN. That would be true. There have been several instances like that, not numerous, but several.

Mr. KASS. And these have been without a fee?

Mr. BROWN. So far as I know; yes.

Mr. KASS. Could you supply for the record the information of those individuals that have given polygraph exams outside of the local and State organizations and outside of the other Federal organizations? Mr. Chairman, could we get that for the record?

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Mr. Moss. Yes. If there is no objection, the record will be held open at this point for that information.

(The information follows:)

In December 1961 and April 1964, in separate cases, Prof. R. L. Holcomb, Department of Public Affairs, Iowa State University, Iowa City, Iowa, gave polygraph examinations at requests of postal inspectors. No fees were charged. In October 1961, on request of a postal inspector in connection with an investigation of Treasury checks stolen from the mails, an individual (a nonpostal employee) was given a polygraph examination by Mr. F. W. Quinn of Quinn & Associates, Greensboro, N.C. A fee of $35 was paid.

Mr. Moss. Mr. Hardy?

Mr. HARDY. Can I clear up a question brought up by Mr. Kass?

In connection with these polygraph tests that are given by other agencies in cases in which the post office is interested—I gather this is what you were talking about, Mr. Montague, a moment ago——

Mr. MONTAGUE. Yes, sir.

Mr. HARDY. You said, or at least I understood you to say, that you had included those tests in your enumeration of the lie detector tests given by others than Department personnel, even though the examinations were conducted by the other agencies strictly in their own interest. Is that correct?

Well, assume the local police department has arrested somebody for some criminal act or alleged act, and they put him through a lie detector test, didn't I understand you to say that if he was also involved in a postal investigation that you would include that lie detector examination in your records?

Mr. MONTAGUE. That is correct. Where a joint investigation was being made by local police and an inspector.

Mr. HARDY. I wanted to understand that it was a joint investigation. That is what I hadn't understood from your previous testimony.

Mr. MONTAGUE. Where it is a joint investigation, yes, sir, where our service would be looking for the thief because of the robbery of the post office, and they would be looking for him because of other local robberies.

Mr. HARDY. In those situations, is the polygraph test conducted on the basis of the questions in which you are interested or strictly on the basis of the aspects of the case with which the local police are involved?

Mr. MONTAGUE. The questions in which we are interested would be included, that is, the inspector——

Mr. HARDY. Are you sure of that? Is that done in every case, or are you just picking up information which is supplied by the local police concerning their examination of a particular suspect?

Mr. MONTAGUE. Where it is a joint investigation, and this action is taken, then questions would be supplied by the inspector so that the man could also be questioned about the post office robbery. Sometimes it develops that the best evidence is with regard to the post office robbery and he is prosecuted on that basis. Other times, the best evidence is on the State case and he is prosecuted in the State.

Mr. HARDY. Could I ask a question about the B. & W. machine?

Mr. Moss. Certainly.

Mr. HARDY. Is that properly characterized as a polygraph?

Mr. BALEIKO. No, sir.

Mr. HARDY. That makes only one graph; is that right?

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Mr. BALEIKO. That is right. It doesn't necessarily make one graph. You read a dial on that type instrument, although I understand there are some improved models where they might create a chart of this one phase.

Mr. HARDY. When did the Post Office Department first start using those?

Mr. MONTAGUE. In 1950.

Mr. HARDY. 1950?

Mr. MONTAGUE. Yes, sir.

Mr. HARDY. That has been a long time ago, to be using something that is the weakest among the so-called lie detectors, if I understand the thing.

I have one other question.

Does the Post Office Department use the General Services Administration for the disposal of surplus equipment?

Mr. MONTAGUE. Yes, sir.

Mr. HARDY. Then how does is happen that you disposed of these lie detector things through your own operations instead of through GSA?

Mr. MONTAGUE. This is the manner in which our service disposes of it, to the property officer in the regional office. He may dispose of it then through GSA. He handles all the surplus property, not just from our——

Mr. HARDY. Do you have special statutory authority to dispose of surplus of your own without going through GSA? What did we set up GSA for, is what is in the back of my head. This thing you were discussing a while ago, frankly, I have the impression that you have a very loose disposal arrangement and I hope it is not so.

Mr. MONTAGUE. It isn't so. The position in the region is specifically for that purpose. It is a administrative position to handle surplus equipment, and then to dispose of it in the most profitable manner possible. If it can be sold, that is done, or if it can be sent to a place where it can be used, that is done.

But I would like to point out there that these machines were 13 years old and they cost about $175 each to start with, back in 1950.

Mr. HARDY. They may not have had any particular value. As a matter of fact, I doubt that they had any when you got them. But at any rate, you did have them and some of us who helped to establish the General Services Administration thought that one of the functions which we were providing for them was the handling and disposing of things of this kind.

Anyway, I think I am going to want to know a little more about this and why the GSA was not brought into the picture. What is the specific statutory authority that the Post Office Department has for disposal of this equipment is the remaining question.

Thank you.

Mr. Moss. The staff will be instructed to develop that information and supply it to Mr. Hardy for inclusion in the record.

(The information referred to appears as appendix 30, p. 505.)

Mr. Moss. Mr. Meader?

Mr. MEADER. Mr. Montague, I noticed that there were 475 polygraph examinations given during fiscal year 1963.

Mr. MONTAGUE. Yes, sir.

Mr. MEADER. How many of those were of postal employees?

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Mr. MONTAGUE. 289.

Mr. MEADER. With respect to those given postal employees, were they all given by polygraph operators employed by the Department, the Post Office Department, or were some of them given by outsiders, local police, or other polygraph operators?

Mr. MONTAGUE. 254 of them were given by postal inspectors. Only 35 were given by outside operators.

Mr. MEADER. Of the nonpostal employees—that would be how many? There were 254 polygraph examinations given to people who were not employed by the Post Office Department?

Mr. MONTAGUE. No. There were 254 postal employees examined by postal inspectors.

Mr. MEADER. So out of the remainder, of the 475, that would be 221 nonpostal employees?

Mr. MONTAGUE. That would be about 186 nonpostal employees.

Mr. MEADER. I subtract 254 from 475 and get 221.

Mr. MONTAGUE. The breakdown, Congressman, is 254 postal employees by postal inspectors, 84 others by postal inspectors, 35 postal employees by other examiners, and 102 other people by other examiners. That will give the 475.

Mr. MEADER. In any of these 475 instances have polygraph examinations disclosed deception, where subsequent investigation showed there was complete innocence?

Mr. MONTAGUE. I have no knowledge of any such case. There has been no case of that nature brought to my attention. Mr. Baleiko, in fiscal 1963 made 70 percent of the tests which were given by postal inspectors. I would ask if he has any knowledge of such an incident.

Mr. BALEIKO. Not to my knowledge. We never had one that was proven otherwise.

Mr. MEADER. Let me see if I can get at it this way: Out of the 475 examinations, how many resulted in disclosing innocence and how many resulted in action of one kind or another, disciplinary action, or criminal action?

Mr. BALEIKO. I don't have the exact figures. I would say that in that number that we are discussing right now, it would be 90 percent innocence, clearance, noninvolvement, or no guilty knowledge.

Mr. MEADER. Ninety percent?

Mr. BALEIKO. Yes. This figure includes a large number of employees—shall I mention that?

Mr. MONTAGUE. I will mention that case. It so happens that fiscal 1963 is an unusually large year for examinations of this type. In August 1962, which is in the fiscal year, we had a million-and-a-half-dollar holdup near Plymouth, Mass. That is a case of major importance.

In that case, we gave 158 of the 475 examinations; 118 of them were to postal employees and 40 of them were to nonemployees. That means that of the tests given by postal inspectors in fiscal 1963, 47 percent were in relation to this case. Of the total number of tests given, 33 percent of them were in relation to this one case.

These tests were not given because we felt these people were guilty; that is, the postal employees. But what frequently happens in a case of this kind is that you have a questionable area and you want to eliminate it. In this instance, many employees would have knowledge of

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the handling of the large registry shipments and unwittingly some may have given information. Someone may have come to the employee and asked questions about the registry shipments, or an employee may have been out in a group and said something about it. It was only to resolve this issue that the employees were questioned; that is, to determine whether in some way information had gotten out, to test their memory on what had actually happened.

A test is not always given to determine guilt of a crime. It is also given to resolve some phase of an investigation—in order to clear up something that hasn't been settled so that you can go on to other things. The Plymouth investigation is one of the big cases that affects these statistics in fiscal 1963.

Mr. MEADER. Let's stick to that case a moment. I would like to follow it up a moment. What was the result of this inquiry in the Plymouth case? Did you ascertain where the loopholes were or how the information got out? What did you find out? Was the use of the polygraph of any assistance to you in investigating that holdup?

Mr. MONTAGUE. That case has not yet been presented to a grand jury. It is still in the investigative stages. We are not in a position where we can talk about all the findings—all the determinations—that were made. I think we can say that the possibility of some leaks was disclosed.

Mr. MEADER. Was the polygraph of material assistance in making that determination?

Mr. MONTAGUE. Yes; it was.

Mr. MEADER. You feel that you would have been handicapped if you had not been able to use the polygraph in this investigation?

Mr. MONTAGUE. I think so; yes, sir.

Mr. MEADER. That is all.

Mr. MOSS. Let's take a little closer look at these 118 tests given in connection with the Plymouth robbery. Were these tests given by postal inspectors?

Mr. MONTAGUE. By Postal Inspector Baleiko; yes, sir.

Mr. MOSS. And at this time you were using the galvanometer?

Mr. BALEIKO. No, sir.

Mr. MOSS. What machine were you using?

Mr. BALEIKO. The Stoelting Deceptograph, which is a polygraph-type instrument, a three-phase instrument.

Mr. MOSS. When did you first acquire your Deceptograph?

Mr. BALEIKO. That was in January 1962, I believe.

Mr. MOSS. So you had had the Deceptographs for a period of about 8 months at the time that this series of examinations was begun. Now were these employees all operating in postal facilities in the Plymouth area?

Mr. BALEIKO. Yes; they were involved either by their close proximity to the registry section, or the truck operations from Hyannis to Boston each of which would be involved in this particular money shipment. Having been drivers or guards on these trucks, they would have been aware that something unusual was coming from Hyannis periodically.

Mr. MOSS. How voluntary was the participation of these employees in those tests?

Mr. BALEIKO. Completely voluntary. Before we went into that investigation using the polygraph, we knew that because of the pos-

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sibly wide dissemination of information concerning money shipments, we would talk to many employees, and prior to undertaking the use of the polygraph in that case, we talked to their organization representatives and laid out the questions we would ask, told them that no other questions involving anything of a personal nature would be included, and we obtained their wholehearted cooperation and support, finally, of course, depending upon the subjects' wilingness to take it.

Mr. Moss. Did any refuse to take it?

Mr. BALEIKO. No, sir.

Mr. Moss. Had they refused, would there have been any stigma attached to the refusal?

Mr. BALEIKO. No, sir.

Mr. Moss. Would they have been subjected to more penetrating investigation?

Mr. BALEIKO. I don't know. The investigators—they might consider aspects of the man's background.

Mr. Moss. As postal inspector, what would your course have been?

Mr. MONTAGUE. May I answer that?

Mr. BALEIKO. Yes.

Mr. MONTAGUE. I think that would depend on the circumstances. It would depend on whether there was some other evidence that would give you a reason to pursue it further. However, we well know that there are people who will refuse to take a lie detector test for many reasons: One, they figure that almost any question asked might cause difficulty—they figure they are nervous and perhaps the machine is going to show they are lying when they are not.

Mr. Moss. Can the machine show if they are lying?

Mr. BALEIKO. The machine will indicate an emotional disturbance has occurred when relevant questions are asked if it is an area that might be of concern to the subject.

Mr. Moss. Is it always an emotional disturbance?

Mr. BALEIKO. I consider it emotional, physiological.

Mr. Moss. Are you aware that the experts appearing before this committee in a panel just a little over a week ago merely regarded it as a physiological—well, not even a reaction. I believe Dr. John Lacey went to rather extreme lengths in spelling out the problem of the cyclical variation in blood pressures which, undetermined by the operators, could indicate a reaction where no reaction had, in fact, taken place.

Are you cognizant of this type of reading?

Mr. BALEIKO. I have heard and read papers on it. I haven't formed any opinion. I keep up with the developments as I can. I imagine that it is a progressive field. There always will be new material that will be brought into the picture which will be of assistance to polygraph examiners.

Mr. Moss. But you have at the moment no idea as to what the reaction might have been if the employees at this point refused to take the polygraph?

Mr. BALEIKO. My only function in that particular case was to conduct the polygraph examinations. I gave the results to the inspectors that were in charge of it. That was my only function in the investigation.

Mr. Moss. What disposition has been made of the record of the polygraph in these 118 cases?

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Mr. BALEIKO. They are in the files in Boston, so far as I know.

Mr. MOSS. In other words, you retain this material in the files?

Mr. BALEIKO. In the investigators' files; yes.

Mr. MONTAGUE. They are in the files covering the investigation, Congressman. That is still a very active investigation.

Mr. MOSS. Are they cross-referenced to the employees' records?

Mr. MONTAGUE. No.

Mr. MOSS. They would not become at any time the basis for judgment about the employee?

Mr. MONTAGUE. No, sir. I should say here that a lie detector test does not become in any case part of an employee's personal file.

Mr. MEADER. May I ask a question?

Mr. MOSS. Yes, Mr. Meader.

Mr. MEADER. Am I clear, Mr. Montague, that the polygraph that has been used by the Post Office Department was solely for investigation and not for employee examination or fitness of employee, not even in your inspection service?

Mr. MONTAGUE. That is correct. We use it only in connection with investigations of violations of postal laws; nothing else.

Mr. MEADER. And it never has been used for hiring of employees or prescreening of employees?

Mr. MONTAGUE. No, sir.

Mr. MEADER. Is there a regulation against it? How does that occur?

Mr. MONTAGUE. No, sir; it just hasn't been used. In our security investigations, we depend on what is on the record concerning the person.

Mr. MOSS. Before I return to Mr. Kass, I have just one other question. You indicated that in seeking to have tests given by other than inspectors, the inspector would have knowledge of the best qualified operators available in that area.

Mr. MONTAGUE. Yes, sir.

Mr. MOSS. Has the inspection service any criteria for qualifying an operator?

Mr. MONTAGUE. Let me put it this way: I was the postal inspector in charge at New York for 10 years before becoming Chief Inspector, and as such, I had to make the decision as to whether a lie detector test should be given, where the Inspector felt that it was in order. If a test for some reason was going to be made by someone outside our service, the Inspector would discuss with me the available operators, tell me their qualifications, what work they had done, and what their reputations were in the community, and particularly, among lie detector people. Our men know these people because of being involved with the U.S. attorneys in court cases. They know what testimony is given. They know who testifies, and they know what the reputation is, the same as one doctor knows what another doctor's reputation is. This is the way the determination is made.

Mr. MOSS. Of course, a doctor usually knows the school the other doctor graduated from, the type of residency he has had, the basic professional qualifications, from the standpoint of education and training.

Do your operators have knowledge of the basic professional qualifications, and the academic qualifications of the polygraph operators? Do you know where they graduated from or where they took their training in the use of polygraphs?

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Mr. MONTAGUE. If there was any question in our minds, we would do the same as we do in all other investigations. We would go to someone who is qualified to know, someone in a university. For example, in New York we would probably go to N.Y.U. or Fordham.

Mr. Moss. Let's take a more remote community where there is no university and where there is not a very large police department. You do have post offices in such communities and you do have crimes occur in those post offices?

Mr. MONTAGUE. Yes, sir.

Mr. Moss. So where in New York you might have vast resources to draw upon, in some more remote area you might not have those same resources. This is the thing that troubles me. The best qualified operator in New York might, indeed, be well qualified, but the best qualified operator in some less populous area might be very meagerly or inadequately qualified and still constitute the best qualified man available in that community.

That is why it seems to me that if we are to use these, the Department should have a criteria at least spelling out minimums that would match its own qualification requirements for its own operators. Is that unreasonable?

Mr. MONTAGUE. No, that is a good suggestion, Congressman. We can very well incorporate it into our instructions.

Mr. Moss. Mr. Kass.

Mr. KASS. Mr. Baleiko, you said you gave all the polygraph exams in the so-called great mail robbery in Plymouth?

Mr. BALEIKO. Yes, sir; so far as I know.

Mr. KASS. Were these polygraph examinations given in any particular location?

Mr. BALEIKO. In an office in the Federal Building in Boston.

Mr. KASS. In a specially prepared polygraph room?

Mr. BALEIKO. No, it was an office that was vacant at the time. It was not what you would call a specially prepared polygraph interrogation room, if you have reference to some of the typical polygraph examination rooms that might be used by police or other agencies. It was an office room.

Mr. KASS. Were there any two-way mirrors?

Mr. BALEIKO. No, sir.

Mr. KASS. Were there any recording devices present?

Mr. BALEIKO. No, sir.

Mr. KASS. Are there any such devices in the Post Office Department?

Mr. MONTAGUE. We have no special facilities. We do not use such rooms. We do not make recordings of polygraph examinations.

Mr. Moss. What type of lighting did it have, incandescent or fluorescent?

Mr. BALEIKO. Fluorescent.

Mr. Moss. Are you aware of the fact that expert testimony before this committee indicates that fluorescent lighting can interfere with the normal operating pattern of these devices?

Mr. BALEIKO. I know that it can have an effect in some instances on the GSR. The output of the light fixture, itself, can become involved in the galvanometer reaction, either make it inactive or else produce erratic charting. Being aware of that, it is taken into consideration.

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Mr. Moss. How do you take it into consideration? Is it something you measure or is it a matter of judgment?

Mr. BALEIKO. No, sir; it is not measured, nor is it a matter of judgment. I didn't use the lights. All the tests were run during the daytime. There was no nighttime testing involved where the lights had to be used. If the situation arises wherein I might conduct a polygraph examination after hours, I use a desk light, somewhat removed from the instrument. The critical area for a fluorescent fixture is anywhere above or below your instrument. Then the GSR tracing can be affected by the output of an appliance or fixture.

Mr. Moss. I asked the questions because most of the Federal Buildings that I go into—in fact all of them here in the House of Representatives, both in the Capitol and in the office buildings—we burn the lights in the daytime.

Mr. MEADER. But not in the White House.

Mr. Moss. We have an effort to achieve economy there at the moment.

Mr. MONTAGUE. Congressman, I will have to change something that I said earlier. I didn't realize that Inspector Baleiko had his three-phase machine for half of fiscal year 1963.

Mr. BROWN. January 1962.

Mr. MONTAGUE. (to Mr. Baleiko). You had it for all of fiscal 1963?

M. BALEIKO. Yes, sir.

Mr. MONTAGUE. He was the only one who had it for all of fiscal 1963. There was another inspector who had it for 3 months of 1963. Outside of that, it was the B. & W. that was used. But this inspector did, as I said previously, conduct 70 percent of the tests which were given by postal inspectors in fiscal 1963, and he had the three-phase machine.

I would like to tell about a case which I think has a little human interest, and because the single-phase machine has been disparaged to some degree. I don't mean to say that we are in favor of the B. & W. The fact that we changed to a three-phase machine shows that we think it is a better machine and it is all we are using now.

But the single-phase machine was not completely without worth. In the hands of a competent operator, it could be beneficial. I just want to cite this one case.

In New York, in the 1950's, and I don't recall the exact date, but I remember the case because I was then the inspector in charge, we had a holdup in the late afternoon, or it was just as the office was closing, at Bryant Station. A man walked up to the counter and put a note over to the clerk to turn over his money or he would be shot.

The holdup man made some kind of motion to indicate that he had a gun. The money was turned over. The robber got out of the station. In fact, it was so near closing time that the guard was at the door and let him out. The thief immediately ran, and the clerk didn't give the alarm until he was already outside.

We followed normal investigative procedure and brought the postal clerk to the police station where he looked over the so-called mug book, to see if he could pick out a likely suspect. He picked out a picture. It happened to be a former postal clerk who would

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have knowledge of postal operations. The suspect was left-handed, the man who took the money had also given indications of being left handed. The thief had reached into the window with his left hand and he had done other things with his left hand.

The suspect was unemployed at the time. He hung around 42d Street. The robber was supposed to have been wearing a gray suit. Two inspectors went up to the suspect's home. They talked to him. He showed them what clothes he had. The only suit he had was a gray suit. He was then partially personally identified—a qualified identification by the clerk.

Our detector examiner at New York gave the suspect a test on the B. & W. and the test showed he had no knowledge of the crime. On the basis of that, the inspectors let him go, even though they had the partial identification and circumstantial evidence.

Two months following that, on a Saturday afternoon, a man walked into our Washington division headquarters and gave himself up as the one who perpetrated this crime, someone entirely different from the suspect. This is a case where the machine was accurate about the suspect and was the means or cause of freeing him of any suspicion of this crime.

Mr. Moss. I think that is very interesting, but I would submit to you that that is not in any sense a scientific evaluation. You might have achieved the same result with a mimeograph machine. It is my understanding—and I will admit that my knowledge of this comes only from witnesses before this committee, and the reading that I have had to do in connection with preparation for this investigation—that not too much is known about the causes or the significance of the flow of electrical current over the skin. That is the only thing measured by the galvanometer.

Mr. Cleve Backster, and I believe, Mr. Baleiko, you would recognize him——

Mr. BALEIKO. I know him personally very well.

Mr. Moss. You would recognize him as being very active in the use and promotion of the use of polygraphs——

Mr. BALEIKO. And a very dedicated man.

Mr. Moss. And he expressed the judgment that the galvanometer was virtually worthless, before this committee. So the fact is that you have here a coincidence. To have scientific significance, it must be repeatable under similar circumstances, and you must undertake some research to establish whether it is or is not a significant fact.

Further investigation on your part might also have cleared the person and, in my judgment, would have been a more valid clearing than that arrived at as a result of the judgment of an operator using only a galvanometer.

Mr. REUSS. Mr. Chairman——

Mr. Moss. Mr. Reuss.

Mr. REUSS. I don't want to be ungracious about this example, Mr. Montague, but while I think the testimony of all three of you gentlemen up to now reflects great credit upon yourself and the service, if I were in your position I wouldn't boast about this particular one because what really cleared the man was that later on you found the guy who really had done it. I would be appalled to think that for 12 years the Postal Inspection Department was letting people go and

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not examining them any more because one of your 15 galvanometers disclosed no erratic skin reflexes, since we have had testimony that the thing is substantially worthless as a practical crime detection device.

This makes me wonder about how many participants in the Plymouth robbery, for instance, may be walking the streets today because an instrument said they were innocent.

Mr. MONTAGUE. The deceptograph, which is a three-phase machine, was used by Inspector Baleiko at Plymouth——

Mr. REUSS. Leave Plymouth aside, but take the 12 years in which these 15 one-phase machines were going strong. If you were closing the file on people because they didn't display a positive reaction, I would recommend that you go back on some of those unsolved crimes and apply normal shoe leather police methods.

Mr. MONTAGUE. Congressman, I cited this case only to show that at least in this instance the lie detector was correct. In any instance, whether it shows positive or negative, it is not conclusive evidence, whether it is a one-phase or three-phase machine. You have to develop your evidence outside of the lie detector. That is, the evidence you present in court. You don't present anything that you get from a lie detector in court or any place else. It is only an assist in an investigation. It isn't used only to try to show you who the guilty person is, but it is also used to show you who the innocent people are.

Mr. REUSS. I don't want to prolong this, but this was my fear. I am interested not only in protecting the civil rights of the innocent, but seeing that the guilty are found. I have several times during our investigation been surprised at the blitheness with which law enforcement officers, after giving somebody a lie detector test, which discloses no positive findings, then sort of call off the investigation, or at least don't pursue it very vigorously.

I suggest that these lie detectors, in addition to other damage that they may do, may actually impede rational criminal investigation because they lull into a false sense of security the inspectors and officers who are supposed to pursue these people. But we each have our views on it. I just wanted to express mine.

Mr. HARDY. I think I would observe that I had a reaction similar to yours, Henry.

Mr. Montague, I noted one comment that you made about this illustration that you gave. You said it relieved the man of suspicion, I think. If it did that, it surprises me that any investigator would accept that as conclusive. The thing that it did, as far as I would be concerned, would be to demonstrate that it hadn't given a thing extra to go on. But certainly the fact that he happened to pass the galvanometer test wouldn't relieve him of suspicion.

He might have had one gray suit. He might have been lefthanded, but in the absence of something else, you didn't have anything that you could press a case on anyway, did you?

Mr. MONTAGUE. No; it was all circumstantial evidence.

Mr. HARDY. That is exactly right. He wasn't relieved of suspicion. You just didn't have anything further to go on, or at least that would seem so to me.

Mr. MEADER. Didn't you say that the clerk who handed over the money identified him?

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Mr. MONTAGUE. That is correct. He identified a picture as being the man, and then in a personal view of him gave a qualified identification. I said it was circumstantial evidence.

Mr. HARDY. Actually, I have known some people who are so proficient in lying that I think the machine would react if they told the truth.

Mr. REUSS. Mr. Montague, you testified that the postal service does not use two-way mirrors in its polygraph work; is that correct?

Mr. MONTAGUE. That is correct.

Mr. REUSS. It is a fact, however, that the postal service does use two-way mirrors to observe postal employees in the washroom, is it not?

Mr. MONTAUGE. You are referring to lookouts in post offices, I believe.

Mr. REUSS. Yes.

Mr. MONTAGUE. I think you are narrowing the field, Congressman. Lookouts are in post offices so that if a depredation is occurring an inspector can to go in and observe the handling of the mail.

Mr. REUSS. Isn't it a fact that in many postal stations you have two-way mirrors so that a postal inspector or someone under his control can observe employees while they are using the toilets?

Mr. MONTAGUE. That is correct. The reason for that is that sometimes thieves put letters in their pockets and then go into the toilet rooms, open the letters, put the money in their pockets, and flush the envelopes down the toilets.

Mr. REUSS. I appreciate the problem you have: A rifler of the mails at a post office has the problem of what to do with the envelope and the toilet is always an attractive way of solving this.

Let me ask about this a little further. Do your inspectors maintain surveillance over the ladies' washroom?

Mr. MONTAGUE. No.

Mr. REUSS. They do not?

Mr. MONTAGUE. No.

Mr. REUSS. Do you have matrons who do that?

Mr. MONTAGUE. No.

Mr. REUSS. Are you familiar with the matter which I understood existed in the post office for a number of years involving the Hilltop Post Office in the city of Milwaukee?

Mr. MONTAGUE. No, I am not.

Mr. REUSS. That involved this practice, and I was particularly disturbed. Not only was there a two-way mirror in which the male employees of the post office were observed as they used the washroom, but there were no barriers at all between the toilets. Furthermore, this room gave upon the employees lunchroom, which I found unesthetic and pointed out to the post office. At that time, I urged the post office to continue, if it wished, its surveillance of employees, but to have the peephole at a level which would permit the use of the normal wooden barrier between the toilets so that there could be some privacy and let the inspector look down from above.

Finally, something was done. But I wondered what the practice was today. Was any reform achieved by this?

Mr. Moss. We will have to have order.

Mr. REUSS. This is an important matter.

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Mr. MONTAGUE. We have lookouts in post offices——

Mr. REUSS. Let me say that I entirely agree with the need for lookout surveillance.

Mr. MONTAGUE. They have been there, as far as I know, ever since the post office has been established, because of the inviolability of the mail. In big offices, particularly, where there are thousands and millions of letters a day, you have to have some means of observing. Lookouts are used only in depredation cases. This is in cases of theft of the mail. For no other reason.

Mr. REUSS. They are used, of course, from time to time, whether or not a depredation has been committed, I would assume.

Mr. MONTAGUE. Only in investigations of thefts of mail. That is the only time a lookout is used. They are used only in that connection; no other.

Mr. REUSS. Do you mean where there has been a series of thefts?

Mr. MONTAGUE. Yes. Where we have letters that are either mailed in that post office and are not accounted for, or where they are for delivery in that post office and not accounted for. We investigate the possible theft of the mail. That is the only time, the only connection, in which a lookout is used.

Mr. REUSS. There is no reason why you can't, through some such surveillance method, keep tabs on possible thefts of the mail through observation in the washroom and at the same time, by appropriate architecture, give a degree of privacy to the person using the particular toilet, and also give a degree of privacy to postal employees whose sole lunchroom facility may be in the room right next door to the toilet room.

Mr. MONTAGUE. I think there was probably a mistake in that instance, Congressman, putting the two so close together. Of course, the policy as to how a toilet room will be constructed is in the Bureau of Facilities, and I don't know what has been done in regard to that.

Mr. REUSS. Are they still pretty open air, so to speak?

Mr. MONTAGUE. As far as I know, they are; yes.

Mr. REUSS. Well, some day we might want to shift our inquiry to the Bureau of Facilities.

Mr. Moss. Mr. Kass?

Mr. KASS. Mr. Baleiko, you stated that in this Plymouth, Mass., robbery, all the individuals taking the polygraph exam did so on a voluntary basis; is that correct?

Mr. BALEIKO. Yes, sir.

Mr. KASS. Did the Post Office Department pay anybody to take a polygraph exam?

Mr. BALEIKO. No, sir. Of all employees that I talked to, and a number of nonemployees, no one was paid to take a polygraph examination.

Mr. KASS. I don't mean the postal employees. I mean the other suspects who were nonpostal employees.

Mr. BALEIKO. To take a polygraph exam?

Mr. KASS. This has been alleged in a Saturday Evening Post article. I don't know if you are aware of it. It is an article dated April 13, 1963, entitled "Hilarious Fun For the Highwaymen." It is the alleged story of the Plymouth, Mass., robbery.

Mr. BALEIKO. That is a good, descriptive term.

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Mr. KASS. It was alleged in this article that an individual was given the polygraph exam for which "they"—and I assume the "they" means the Post Office Department—insisted on paying him $50. Then they fastened a tiny radio transmitter to his back and sent him around to talk to "some of the suspects."

Mr. BALEIKO. Absolutely not.

Mr. KASS. This is not true?

Mr. BALEIKO. No.

Mr. KASS. Mr. Baleiko, how many polygraph examiners are there in the Post Office Department today?

Mr. MONTAGUE. I will answer that question. There are six.

Mr. KASS. Mr. Montague, how have they been trained?

Mr. MONTAGUE. Mr. Baleiko had his training back in 1948 at the Keeler School in Chicago. Two attended the Backster School of Lie Detection in New York. Two attended the U.S. Army Provost Marshal School at Fort Gordon, Ga. One attended Gormac in Pasadena, Calif.

Mr. KASS. Backster School is run by Mr. Cleve Backster?

Mr. MONTAGUE. Yes, sir.

Mr. KASS. What is Gormac?

Mr. MONTAGUE. Gormac is a school which was recommended to our people on the west coast. I believe Mr. Brown may have some information on it.

Mr. BROWN. Yes. We had had a list of two or three schools on the west coast. We wanted to send a man out there because he was from the California area, and for economic reasons it was best to keep him there, when sending him to school. One of our assistant inspectors in charge made an investigation of the two or three on the list. According to the information that he was able to obtain, here, again, by inquiry of people who would know the qualified schools in the area, and his own investigation of the schools, he decided that the Gormac was the best. Gormac is operated by a man named Douglas Gourley, who is the vice president of Gormac, and a professor and head of the Department of Police Science and Administration at Los Angeles State College.

Mr. KASS. You gave a very vague description of who picked the school and under whose recommendations. Could you, for the record, explain who was the postal inspector that picked the school and under whose recommendations did he accept it?

Mr. MONTAGUE. Our assistant inspector in charge, stationed at Los Angeles, Jim Hudson.

Mr. KASS. Is he a polygraph examiner?

Mr. MONTAGUE. No, he is not a polygraph examiner, but he is one of our supervisors in the San Francisco division. He is well acquainted in all law enforcement circles in California. He knows well of all the courses in criminology that are conducted by the various colleges in California. He, from these enforcement associates, obtained recommendations. It was on that basis that this school was recommended.

Mr. KASS. You stated for economic reasons, Mr. Brown. How much does it cost to send an individual to the Gormac School?

Mr. BROWN. The tuition cost was $575.

Mr. KASS. That includes the whole package?

Mr. BROWN. Yes, sir.

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Mr. KASS. At the end of how long a period does he become a polygraph examiner?

Mr. BROWN. The course is 4 weeks, including half-day on Saturdays, and several night sessions.

Mr. KASS. Mr. Brown, how much does it cost you to send an individual to the Fort Gordon, Ga., school?

Mr. BROWN. There is no cost involved there.

Mr. KASS. There is no cost involved?

Mr. BROWN. No, sir.

Mr. KASS. Would it have been cheaper to send this individual to the Fort Gordon School?

Mr. BROWN. I had in mind the expenses, per diem, and travel from California to Gordon and remaining there.

Mr. MONTAGUE (to Mr. Brown). In addition to that, isn't there a waiting list?

Mr. BROWN. There is also a quota for Gordon.

Mr. MONTAGUE. And it was also the expediency of the situation, that is, we wanted to have an inspector get formal training in a good school. Of course, this school is on the west coast where the inspector is located.

Mr. KASS. How much does it cost you to send an individual to the Backster School?

Mr. BROWN. $525.

Mr. KASS. So the Government spent $1,050 for these two individuals to go to the Backster School?

Mr. BROWN. Yes, sir.

Mr. KASS. How long is the Backster School?

Mr. BROWN. The Backster School is 6 weeks.

Mr. MOSS. Let's establish something here. On the completion of the course at the Gormac School, did you then regard—was it a postal inspector?

Mr. MONTAGUE. Yes, sir.

Mr. MOSS. Did you then regard him as a qualified polygraph operator?

Mr. MONTAGUE. He is qualified to give tests. Up until now he hasn't had too much experience at it since the machine was assigned to him only in February 1964. In fact, four of our six men received their machines in February 1964. That is just a few months ago.

Mr. MOSS. So that the record will show, regardless of when they received their machine, that upon the completion of a 4-week course, the Post Office Department then regards the inspector as fully qualified on his own to give polygraph or make polygraph examinations?

Mr. MONTAGUE. Yes, sir. That is the purpose of the school, to qualify him for that.

Mr. MOSS. You are aware, I assume, of the testimony given by many witnesses before this committee. I believe I speak the consensus of those witnesses, that they would not regard such a person as qualified? Mr. Backster would not regard them as qualified unless they worked under an experienced polygraph operator for an extended period of time. Mr. Reid and Mr. Lindberg, of Reid & Associates in Chicago, would not consider him qualified unless he worked under supervision for an extended period of time. Professor Inbau, of the Northwestern School of Law would not consider him qualified.

Without exception, the group of psychiatrists and neurophysiologists who appeared before the committee would not regard such a

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person as qualified. This is without any prejudice to a further independent evaluation of the whole procedure, but merely accepting the views of those who regard polygraphs as valid instruments. They would not regard your personnel as qualified to give examinations independently.

Mr. MONTAGUE. Congressman, Mr. Baleiko has been giving lie detector tests since 1950.

Mr. Moss. I wonder if at this point, Mr. Montague, for the sake of this record, you will clarify your use of "lie detector tests." There is no lie detector, is there? You cannot buy a lie detector, can you?

Mr. BALEIKO. No.

Mr. Moss. You can buy a polygraph?

Mr. BALEIKO. That is correct.

Mr. Moss. And it does not tell you this person is truthful, or reliable, or untruthful or unreliable, does it? It merely gives you certain physiological actions or reactions representing some function of the human body, not fully understood even by the best informed in the research field. Am I correct?

Mr. BALEIKO. That is the professional attitude; yes, sir.

Mr. Moss. And when you take this device and you have a human operator, if there is a lie detector, that human operator is the lie detector, making judgments on the basis of the readings secured on the graphs of this machine.

Mr. BALEIKO. That is what you would call an experienced polygraph examiner; yes, sir.

Mr. Moss. I think we should make it very clear here that in your use of the term "lie detectors" it should be understood that it is not an established fact that such is available.

You may continue. I am sorry for the interruption. You may continue.

Mr. MONTAGUE. As with any of our investigation programs, be it fraud or depredation work, or any other, our plans would contemplate that we have training conferences of the inspectors who are engaged in this type of work, and, in addition, as Mr. Baleiko has done over the years, they would attend seminars and professional conferences which are held at periodic intervals throughout the country.

Mr. Moss. Let's see what we do at these training conferences. You now have polygraphs. A graph is actually produced on graph paper. You can sit down and with the questions as a key, you can analyze the graph and discuss the independent views of the operators.

But this is a recent development in the post office. You previously had the B. & W. machine.

Mr. MONTAGUE. That is right.

Mr. Moss. I suppose if it was anything, it was a unigraph, a monograph, or whatever you might call it. Well, it wasn't a graph. You didn't produce anything, did you?

Mr. MONTAGUE. No, sir.

Mr. Moss. You had a meter. So you couldn't duplicate in a training conference any meter readings, could you? Using the B. & W. there could only be a flash judgment on the part of the operator. He couldn't sit down and carefully study a graph and attempt to relate it to the questions, making a careful, studied evaluation. He had only the flick of the meter as an indication.

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What do you discuss in these training sessions and what have you discussed?

Mr. MONTAGUE. Wherever we bring men in for any training session, and it would be the same in this, we would give the men an opportunity to discuss the problems with which they have been faced, to have a conference leader who would test them out on how they are operating the machine. We have called for reports by July 30 as to what problems they have had in operating these machines and these will be evaluated.

We will probably depend on Mr. Baleiko to a great extent to lead the conferences of this kind and to make evaluations?

Mr. Moss. This is something that is going to occur?

Mr. MONTAGUE. Yes, sir.

Mr. Moss. But you have had 13 or 14 years, almost, for use of some sort of mechanical or electrical device to aid you in determining the truthfulness of the persons interrogated by postal inspectors. So it is for this period that we must make some evaluation of the adequacy of training, and the validity of methods employed.

How could you review the operators' use of the B. & W. machine?

Mr. MONTAGUE. I am talking now about the current system after the men received their training in the various schools. They had their machines assigned to them just about 3 months ago. Previously, initially, the men who were to operate the B. & W. machines were brought into two different places for instruction conferences. They were given the instructions. They then went into the field for a couple of months, after which they came back again for further conferences.

That was back in 1950. Since then there has been a lot of development in this equipment, much of it recently.

Mr. Moss. But not in the Post Office Department until 1962?

Mr. MONTAGUE. Anyone who was a detector operator up until now had on-the-job training. Any inspector who was being selected to operate a machine was placed under instruction of an inspector who had been trained in it and was given at least 6 months on-the-job training in the use of the detector, until the more experienced man was satisfied.

Mr. Moss. Now we have a very confused record. A few moments ago, in an effort to clarify the record, you responded to my question as to whether or not you regarded a graduate as immediately competent to give examinations, and you indicated you so regarded him. Now you are saying that you have an on-the-job training program.

Mr. MONTAGUE. Yes, Congressman. I had referred just prior to that to the men going to school and getting their machines. I was talking about the current program and what the current program will be.

Mr. Moss. All right. When does the current program begin and the old one terminate?

Mr. MONTAGUE. It has begun. These men have had their formal training. They are giving lie detector tests. We have instructions out to these men to submit reports by July 30 to tell us what problems they have, what the difficulties have been. We will have those analyzed. It is our intention to then call the inspectors in here for a conference of whatever length may be required and go over these things, and let Mr. Baleiko test them out.

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Mr. Moss. Are these the mechanical difficulties, the functional difficulties?

Mr. MONTAGUE. Difficulties of any kind.

Mr. Moss. The fact is, though, that they are not under supervision in the giving of or making of examinations at the present time. They independently operate the machines and make their own judgments as to the person being examined.

Mr. MONTAGUE. That is correct.

Mr. Moss. Then this is a postaudit of problems, and if they have to audit, is there a discussion anywhere?

Mr. MONTAGUE. Yes; they have their training programs, and, in addition, they would be authorized to attend other seminars and conferences which may be held in their various areas.

Mr. Moss. In polygraph operations?

Mr. MONTAGUE. Yes, sir.

Mr. Moss. Are there such seminars?

Mr. BALEIKO. Yes, sir.

Mr. Moss. Who conducts it?

Mr. BALEIKO. The University of Oklahoma has one annually, a very good course, a short course.

Mr. Moss. Will you bring the Pasadena operator into Oklahoma for this?

Mr. BALEIKO. He hasn't been in the field long enough, but I imagine he will be informed of these seminars, and given the opportunities to attend.

Mr. Moss. You presume that he will. You either have a policy or you have not. He will or he will not.

Mr. BALEIKO. I believe I have made some reference to that in a report I submitted, that it would be beneficial to join polygraph examiners organizations.

Mr. Moss. We are faced here with a recommendation and not a policy, then, are we not?

Mr. MONTAGUE. I am stating what the policy is and will be. That is within my area of responsibility.

Mr. Moss. More precisely, you are stating what the policy will be?

Mr. MONTAGUE. Yes, sir.

Mr. Moss. And the policy up until they received the new machines was not that which you are now relating?

Mr. MONTAGUE. No. It was on-the-job training under an experienced inspector at that time.

Mr. Moss. On-the-job training under an experienced inspector who was not a polygraph operator?

Mr. MONTAGUE. Who was an operator of the B. & W.

Mr. Moss. Were all of your inspectors operators of the B. & W.?

Mr. MONTAGUE. No. We had one man in each of our 15 divisions. That was passed down by on-the-job training from 1950.

Mr. Moss. In other words, let us take a case. Let us take the inspector in San Francisco. He operated the B. & W. machine and he gave on-the-job training to subordinates or associates. It that correct?

Mr. MONTAGUE. He gave on-the-job training to some other inspector who might be selected to operate the lie detector. We never had more than——

Mr. Moss. We have established that there is no lie detector, so we are talking of the B. & W. machine.

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Mr. MONTAGUE. All right, the B. & W. machine. We had only one man designated in each of the 15 divisions.

Mr. Moss. What training did he have?

Mr. MONTAGUE. Back in 1950 they had training conferences here and at another location in the country.

Mr. Moss. Let us not go back so far. Let us go back to 1960. What training did he have in 1960?

Mr. MONTAGUE. That is how it started, from 1950. The men who were given the training at that time—if they were going to be replaced on lie detection work—would start training somebody else. We did not train a lot of inspectors to do this; there wasn't any reason for it. It was just where there was going to be a replacement, or where you wanted to have a man in reserve.

You might have one additional man in a division trained, and it was on-the-job training.

Mr. Moss. Let us take this basic man that you started with in 1950. What training did he have? There were 15 of them.

Mr. MONTAGUE. I was not here in Washington so I can't say positively.

Mr. Moss. Were either of your associates here?

Mr. BALEIKO. I was; yes, sir.

Mr. Moss. What training was given in 1950?

Mr. BALEIKO. The training consisted of two conferences, dissemination of brochures, reading matter and a handbook, I guess, published by the manufacturer and his representative.

Mr. Moss. It was self-help?

Mr. BALEIKO. Very much so; yes, sir.

Mr. Moss. And the manufacturer attended?

Mr. BALEIKO. The manufacturer attended the conference and conducted the session.

Mr. Moss. He showed you how to operate it. Did he give you instructions in human physiology?

Mr. BALEIKO. No; he did not.

Mr. Moss. Is it not rather essential, if you are going to operate this?

Mr. BALEIKO. That is correct. That is a basic instruction.

Mr. Moss. So you really had very inadequate training as operators of these B. & W. devices?

Mr. BALEIKO. There was much reliance placed in the selection of the men, that they have knowledge of human behavior and psychology. That was a basic point in the selection of the men.

Mr. Moss. Had they had a course in psychology, we will say at a university?

Mr. BALEIKO. Some of them must have had; yes, sir. I did not know their personal history. I was another one of the inspectors that was in the program.

Mr. Moss. This might have been part of their makeup and it could well have been completely lacking.

Mr. BALEIKO. I do not know, sir, because I do not know what instructions were issued to the inspectors in charge, except to make a careful selection of the personnel.

Mr. Moss. Then this was a very informal procedure, was it not.

Mr. MONTAGUE. May I say this, Congressman: Each one of the men selected was an experienced criminal investigator of long standing who had a very good record and was well respected in his division.

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In my opinion, there is no better course in psychology than criminal investigation—practical, on-the-job training. This is where you learn more about human nature and psychology than you do anywhere else.

Mr. Moss. All right, Mr. Montague, you have had many years of this. I want first to stipulate for this record that I have a very high regard for the postal inspection service. I believe that it operates with great efficiency in practically all areas.

I am not attempting to detract at all from its very fine record. But what do you know about human psychology as it produces physiological reactions in a human being?

Mr. MONTAGUE. Well, you do learn that when you talk to another person, with or without a polygraph, you can pretty well size up whether or not he is telling the truth, and you can evaluate persons. This comes from experience.

Mr. Moss. When his hands start to sweat, what deduction do you make?

Mr. MONTAGUE. It might mean he is nervous.

Mr. Moss. It might mean he is nervous?

Mr. MONTAGUE. Yes.

Mr. Moss. Might it mean that he is ill?

Mr. MONTAGUE. It could mean that he is ill, yes.

Mr. Moss. Might it mean that he has taken some medication? You have been measuring this for almost 13 years and taking it as an indication of truthfulness. What does it mean?

Mr. MONTAGUE. I have not been operating a B. & W., but I will ask Mr. Baleiko to answer.

Mr. Moss. What does it mean?

Mr. BALEIKO. Well, I guess they are looking for the answer to that, Congressman.

Mr. Moss. We do not know what it means, do we?

Mr. BALEIKO. Nobody really knows. There are many theories.

Mr. Moss. All we know is that the man appears to be perspiring in the palms of his hands. I am doing it right now. I feel that I am very truthful. But I would probably get a pretty good reading on one of these devices, would I not?

Mr. BALEIKO. I would think so. You might be susceptible to it.

Mr. Moss. And this might make you, if you were interrogating me, bear down much more heavily, and—in effect—say, "All right, Joe, come along now. You know very well you are guilty." Is that not right?

Mr. BALEIKO. That could be a mistake that somebody could make; yes, sir.

Mr. Moss. There is a high degree of probability that such a mistake would be made. So let us relate this value, and I do not question the value of experience in criminal investigation, in understanding the outward signs, readily discernible to the eye, of human behavior.

But I question very seriously that it gives you any insight into physiological functions of the human body. They are extremely complex. Would you agree?

Mr. MONTAGUE. I agree.

Mr. Moss. And this is essentially a device reading physiological function. That is all it does. Even the polygraph, even the nine phases that Dr. Lacey has in his machine at the Fel's Institute.

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I understand they can put many more channels on it and all they do is to bring to the operator's attention the fact that the body is functioning. So we really have had in the postal service up to this point no real training program.

Mr. MONTAGUE. I can't agree with that, Congressman, because it was on-the-job training, and we had some very capable and qualified men. It has not come to my attention that they made any mistakes. If they had been unqualified, if they had not been doing their job, there would have been indications along the line somewhere of mistakes.

Mr. Moss. What objective analysis has the inspection service made of results obtained either from the B. & W. the deceptograph, or the Keeler machine?

Mr. MONTAGUE. Do you mean with respect to operation in our own service?

Mr. Moss. Yes.

Mr. MONTAGUE. We have not had opportunity yet to evaluate the operation of the new machines. We will do so. But with regard to a test formerly being given on a B. & W. machine, or the new machine for that matter, the postal inspector in charge of the division would know about it. An inspector, when he finishes his investigation, has to make a report on the case, to tell what was done.

So the inspector in charge not only knows that an inspector is going to give the test, but he is probably personally informed as to the outcome and what occurred. Then there is a postaudit through the report.

In every investigation we make, there is a report. So we also have this control and this evaluation of what is being accomplished.

Mr. Moss. Mr. Baleiko, have you ever given a B. & W. test with negative results to a person subsequently found to have been implicated in a crime involving the postal service?

Mr. BALEIKO. Not to my knowledge; no, sir.

Mr. Moss. Have you ever analyzed the records of the inspectors to determine whether such has occurred? Have you ever objectively sought this information?

Mr. BALEIKO. None was brought to my attention. I did not act as a coordinator in the sense that I reviewed others' reports; no, sir.

Mr. Moss. Mr. Montague, has the inspector service ever made an analysis?

Mr. MONTAGUE. I do not think I understand the question, Congressman.

Mr. Moss. You apparently regard the use of this device as fairly infallible?

Mr. MONTAGUE. No, I did not say that and I do not mean to.

Mr. Moss. You know of an instance where an innocent individual gave a positive reading, and your associates know of no instance where a guilty individual gave a negative reading. This must have been the judgment arrived at because of some study or evaluation.

Has such study or evaluation been made?

Mr. MONTAGUE. I have no knowledge of such an evaluation having been made. With regard to my mention of a mistake, I feel quite certain that if an injustice had been done to anyone in connection with any of these tests, we would have known about it, we would have heard about it, and I have not heard about any cases.

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Mr. Moss. It seems to me if the Government is going to use anything with the fallible characteristics of mechanical devices to determine truthfulness, it should undertake—through some appropriate inshop research or evaluation—a study to know whether the device is worth the dollar it costs.

Mr. MONTAGUE. What we have put in, moneywise, is very nominal, I feel. The machines which we are currently using cost about $7,080, altogether.

In our report to your committee, we listed 16 inspectors as having been polygraph examiners, but we showed that they devoted about 3 percent of their time to this work. Overall, this would be about half the time of one man for a year being devoted to such work.

Mr. Moss. I realize that. The inspection service has not invested a lot of money. But this seems to be a growing field in Government. The committee's responses from the departments and agencies indicate that we are now reaching near the $5 million annual cost figure and that we continue to acquire new and more costly devices.

Thus far, in the course of the investigation by this subcommittee we have found no agency which has undertaken the type of evaluation which, in my judgment at least—and I do not presume now to speak for the committee—should have been made and should be currently made, if we are to continue to acquire these devices and expand the use of them.

Mr. MONTAGUE. Our cost for our present program, was $7,080 for the machines, in the neighborhood of $2,000 for instruction expenses, and I think that we will not spend over $10,000 a year for the polygraph program.

We gave about 475 polygraph tests in fiscal 1963, but that was a much larger number than normally conducted because of the Plymouth, Mass., investigation. Normally, we would probably run in the neighborhood of 300 or less tests in a year, and it would take, overall, about half the time of one inspector. The program is nominal, as far as our Service is concerned. Results are not used as evidence in court. They are used to clear up areas which will help us to get the investigation completed.

For example, in some instances, and we use the machine only in cases of more than average importance—I would think that the majority of our cases involve registered mail, as did the Plymouth, Mass., case. As there, you have employees who know that they are supposed to handle the mail in a certain way, and when the inspector asks, "How did you handle that piece of mail?" some will say that they did it according to the way the instructions require.

You don't suspect them of doing anything wrong, but you want to test their memories as to whether or not they are positive they actually handled it that way, because this could be crucial in the investigation. If they handled it that way, then you are going to go in one direction of your investigation. If they made a mistake and handled it some other way, you are going to go in another direction in your investigation

This is what some of the tests are for. They are not always to show if a man is guilty or innocent. This is part of the criminal investigation, and it is to eliminate some of the avenues that you might be led up without any beneficial results.

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Mr. Moss. I appreciate that fact. But you still do not know the worth of the machine because you have not studied it. You can only assume.

Mr. MONTAGUE. Well, we do know that we have had benefits from it. We may not have evaluated it in the way you outlined, but we do know that we have had benefits from it.

Mr. HARDY. Mr. Chairman?

Mr. Moss. Mr. Hardy?

Mr. HARDY. To follow up on this line of questioning, Mr. Montague, you gave us a case a while ago where you said that the suspect had been relieved of suspicion by the use of the machine. You gave us one case where subsequently there was someone else who was found guilty.

Mr. MONTAGUE. Yes, sir.

Mr. HARDY. Have you not made any effort to determine whether anybody that was supposed to be innocent by virtue of one of these tests was later found guilty?

Mr. MONTAGUE. Yes; that has happened, Congressman, because the test is not the end. The test is only one of the means that you may use to try to accomplish your investigation.

Mr. HARDY. I understand that. But Mr. Moss has been trying to determine the extent to which you may have evaluated the reliability of these gadgets. I was listening rather carefully, because I had hoped that somewhere along the line you had made some effort to determine the extent to which it has been accurate or had been misleading. Of course, it may have some uses in weeding out or reducing the avenues of investigation. Maybe it does serve some purpose there. I do not want to discount that aspect of it.

But I think in order to determine the reliability of it, you will have to know something about the number of instances in which it has produced true or false, either positives or negatives.

Mr. MONTAGUE. I agree that it would be worthwhile to do that, and we can do it and we will do it. On the other hand, we know from working with it every day that it does have benefits. You don't stop to evaluate everything that you work with every day. You know you use it. You know it is of benefit to you. That is the way this situation is. When you work with it every day, if it is no good you throw it out; you do not use it.

Mr. HARDY. I do not know. Sometimes we have thrown out things that have been good and sometimes we have kept things that have misled us a long time, I have found out, in some of my associations with other agencies. I want to get to another aspect of this thing.

We have talked about these training courses, and the different schools to which your personnel have been sent. We have talked about on-the-job training. We have talked about refresher courses. We have talked about seminars. We have tried to determine what the current policy of the Department is. I have had the feeling that we have been developing policy here this morning in some of your answers.

Do you have that feeling, too?

Mr. MONTAGUE. No; Congressman, you are forgetting that we told the committee that this is a new program. We gave you copies of our instructions. We told you the machines were obtained in February for these men. We told you what our intentions are. This is our policy with regard to all types of investigations.

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Mr. HARDY. I am trying to see if I can understand what your intentions are, whether you have really established any policy in that regard. Do not misunderstand me, if you are developing some worthwhile policy here this morning, I think that is fine. But I do not think that we ought to try to understand something has been going on. For instance, you talk about on-the-job training. In the early part of the testimony I got the impression that there has been some extensive on-the-job training in the past. But now I get the impression that this is something about to start.

Mr. MONTAGUE. There was on-the-job training in the past because we had the one-phase machines and we had men who had been trained and had gained experience in it back in 1950. There was on-the-job training with regard to those machines.

Now we are starting with an entirely new machine.

Mr. HARDY. The on-the-job training does not mean anything to me unless we have some indication as to really what it consisted of.

Did a man, after he had taken his training course—I do not know how long it was for the B. & W. machine—did he have a competent and qualified—if there were such, and I doubt that there were— operator of this B. & W. machine assist him over a long period of time?

Mr. MONTAGUE. Yes.

Mr. HARDY. We have talked so much here that I do not know whether this is really concrete or whether we are just reaching into a hat for what was supposed to have happened.

Do you know, as a matter of fact, that for a period of—well, somebody mentioned a year, I think you did—for a period after the course was completed that actually the fellow who was going to become an expert had with him someone who was a qualified operator?

Mr. MONTAGUE. Yes; that was up until we started with our new machines. But now we have a three-phase machine and the inspectors who are trained in it are the first ones to get such training.

So we do not have experienced men who can give on-the-job training in this machine. These are the first men to get this training. In the future, there is no doubt we will use these men to give on-the-job training to people who may follow. But as of now we do not have people who had previously received training in these particular machines, who can give on-the-job training in them.

Mr. HARDY. You have six of those; is that right?

Mr. MONTAGUE. That is correct.

Mr. HARDY. You have six of those, so actually they are not receiving any on-the-job training, are they?

Mr. MONTAGUE. No; they are not.

Mr. HARDY. I got the impression that they were. This is an even more complicated machine than the others. So they are getting their on-the-job training by attending seminars, carrying along these graphs with them and interpreting them; is that what they are doing?

Mr. MONTAGUE. That is correct, they will be. But some of these men were B. & W. operators also. They did have the training on that machine.

Mr. HARDY. For whatever that amounts to.

Mr. MOSS. Would you yield at that point?

Mr. HARDY. Yes, Mr. Chairman.

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Mr. Moss. Is it not a problem—and I think I will address this question to Mr. Baleiko—is there not a problem in converting from the single-phase to the three phase? Dr. Kubis—and I believe you recognize him as an expert in this field—a qualified M.D., a psychologist, and who has done a lot of research, indicated that there is a tendency on the part of operators to build a reliance on one dominant feature of the machine, the galvonometer, for instance. They feel more secure in relying upon it than they might the reading of respiration. Where you have men who have been operating solely with the galvonometer is there the probability here of a tendency to continue reliance upon the galvonometer?

Mr. BALEIKO. I hope not. I do not know, if anybody has a weakness for something he probably will make it his pet. But a man who is considering all aspects—that is why you have a three-phase machine, so it will give you other criteria to judge.

If I have anything to do with instituting some guidelines, I will probably furnish something along those lines and the chief might consider them in our program of training as it continues.

Mr. Moss. Thank you. Mr. Hardy.

Mr. HARDY. How many of these six operators that you have now for the polygraph machines actually were experienced in the use of the B. & W. machine?

Mr. MONTAGUE. Three I am positive of, Congressman; Mr. Baleiko, Inspector Shea at New York, and Inspector Farrell in Cincinnati.

(To Mr. Brown:) Do you know whether any of the other three?

Mr. BROWN. No.

Mr. HARDY. Then, actually, half of your force has had some previous experience with the single-phase gadget.

Mr. MONTAGUE. That is correct.

Mr. HARDY. We were talking awhile ago about refresher training courses. Is this something that is going to happen in the future or has that happened in the past?

Mr. MONTAGUE. It has happened in the past with every phase of our investigative responsibilities. As I said, the fraud investigations——

Mr. HARDY. I am just talking about the operation of these machines now.

Mr. MONTAGUE. No, there were no refresher courses with regard to these machines because they were handled by the on-the-job training within the division. So there was no refresher course bringing them into Washington. Although, our men did belong to professional organizations, such as Mr. Baleiko, and did attend seminars outside. Also, some of them received further training outside.

For example, at New York, I know that the inspector who was there took a 1-year course at NYU, and it covered psychology as well as all of the other subjects which you mentioned, Mr. Chairman, that might be important in connection with the use of the B. & W. machine.

Mr. Moss. Did it cover psychology as it relates to responses under such machines?

Mr. MONTAGUE. Yes.

Mr. Moss. There are many courses in psychology.

Mr. MONTAGUE. No; the principal thrust of this course was the operation of the polygraph machine.

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Mr. HARDY. Having gotten rid of your B. & W. machines, you wind up now with six of the newer type ones, with three operators who previously had experience with the B. & W. and three brandnew ones who have just completed these courses and have been operating these things for 2 or 3 months.

Is that correct?

Mr. MONTAGUE. Yes, sir; that is correct.

Mr. HARDY. What are your specific plans for refresher courses? I am talking about these machines now. Let us not confuse it with your normal training of your inspectors, of your refresher courses for inspectors.

What specific plans do you have for refresher courses for these operators?

Mr. MONTAGUE. As I mentioned previously we had sent out instructions to the inspectors and we want reports on these by July 30. We did that for the purpose of getting the reports in here and evaluating the operation of the machines. We used Mr. Baleiko's services, as I explained, back in 1961 to evaluate this whole situation, and it was as a result of that that we went into this program. It is my intention to use him to evaluate these reports when they come in, to decide what has to be taken care of in any refresher training program, and then get these men in here for that purpose.

Mr. HARDY. Mr. Chairman, I think it might be helpful if we had a copy of the specific instructions that Mr. Montague sent out to the six operators.

Mr. Moss. Mr. Montague, will you supply that for the record at this point?

Mr. MONTAGUE. Yes, sir.

(The information to be furnished follows:)

JANUARY 30, 1964.

E. G. MCKAY,
Inspector in charge,
Atlanta, Ga.

DEAR MR. MCKAY: Referring to M.B. 306, it will be appreciated if you will have Inspector W. J. Penley submit a report in about 6 months furnishing the following information regarding the operation of the polygraph assigned to him:

1. Brief summary of each case in which the polygraph was used, and results.
2. Amount of time spent on giving examinations.
3. Any problems encountered in the operation of the machine.
4. Comments of general interest regarding the program, as well as suggestions, and recommendations for any changes in procedures.

Sincerely yours,

H. B. MONTAGUE,
Chief Inspector.

Identical letters, except for names, were sent on the same date to the postal inspectors in charge at Chicago, Ill.; Cincinnati, Ohio; New York, N.Y.; Philadelphia, Pa.; and San Francisco, Calif.

Mr. HARDY. I think I can understand that, in the absence of having received this report, you would not have thus far been able to establish an agenda for a training course or a refresher training course.

Mr. MONTAGUE. We have not. We have not established any agenda.

Mr. HARDY. Reference has been made to seminars. You have not been in this operation long enough to have your people attend any seminars on this kind of machine, have you?

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Mr. MONTAGUE. Not on this particular machine. But Mr. Baleiko can tell you that within the past 2 years—you have attended three separate seminars, as I recall, have you not?

Mr. BALEIKO. Yes.

Mr. MONTAGUE. Who sponsored them?

Mr. BALEIKO. The University of Oklahoma sponsored the one a year ago in March, and then the Academy for Scientific Interrogation held one in New Orleans last August. The American Academy of Polygraph Examiners also had one last September. I attended that.

Mr. Moss. Mr. Baleiko, when you attended them, you had 15 operators. How many of the 15 attended?

Mr. BALEIKO. This is limited to members of the academy, and as far as I know there was no other member in the academy.

Mr. Moss. Did you attend these under Government sponsorship?

Mr. BALEIKO. Some at Chicago I did on my own. I took annual leave and attended on my own. But the last three I requested to attend as a postal inspector and I obtained permission to do so.

Mr. Moss. Did other postal inspector-operators attend?

Mr. BALEIKO. I didn't mean——

Mr. Moss. What I wanted to say is that here again we are not faced with a defined program, but one that may occur rather than shall occur. On these seminars, you may or you may not participate.

Mr. BALEIKO. That is correct.

Mr. Moss. It is not part of a planned program of instruction, further instruction, for the inspector-operators of these devices. Am I correct?

Mr. BALEIKO. Yes; we have not been able to formulate one until initial information is obtained in that first report.

Mr. HARDY. Let me understand what the seminars that you attended consist of. Did they relate strictly to lie detection procedures and the use of these machines?

Mr. BALEIKO. No. You may have somebody give a paper on the physiological aspects of criminal interrogation, with or without the instrument. You may have Mr. John Reid or Mr. Harrelson, from the Keeler's school there, or their representatives, give their papers. Cleve Backster attends almost all of them.

All the aspects of criminal interrogation, whether it is with or without instrumentation, are usually covered in the discourses that are programed.

Mr. HARDY. These are broad subjects that you deal with in these seminars. This is criminal investigations.

Mr. BALEIKO. They are aimed especially at polygraph operators.

Mr. HARDY. It does not specialize on polygraph operators?

Mr. BALEIKO. No; I would say it is especially aimed at polygraph operators. In fact, the Academy of Scientific Interrogation seminars are for polygraph examiners. The University of Oklahoma gave their course for polygraph examiners. Cleve Backster was there and demonstrated with slides and charts, and interpretations of results, for those in attendance.

They deal with actual physiological and other aspects of polygraph examinations.

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Mr. Moss. I would like to express the hope that the communication in those seminars was more understandable than that achieved at our first hearing.

Mr. HARDY. I will join with that.

The observation I was about to make is this, that with these broad subjects you must have felt considerably handicaped by the Post Office Department if they only gave you one of these B. & W. machines to monkey with.

Mr. BALEIKO. I had an interest in the polygraph even though the other machine was assigned to our division. I kept my hand in polygraph operations.

Mr. HARDY. But the seminar, insofar as the seminar is concerned, as it applied to the operation of a polygraph, did not help you in your postal work because you did not have a polygraph machine to operate.

Mr. BALEIKO. I had polygraph machines available to me in the event I wanted to use one.

Mr. HARDY. Did you ever use them in postal interrogations?

Mr. BALEIKO. I used the machines that were available in the Secret Service; yes, sir.

Mr. HARDY. So you used the Secret Service machine but you had not even been checked out in that. You just picked this up out of a hobby?

Mr. BALEIKO. Picked what up, sir?

Mr. HARDY. The polygraph. You were officially assigned a B. & W. machine.

Mr. BALEIKO. Yes, but I was trained in the Keeler method. I was a Keeler school graduate.

Mr. HARDY. Then the Post Office Department should not have been using your talents for training, and then just give you a dinky thing like that.

Mr. BALEIKO. I had no choice in the matter.

Mr. HARDY. I appreciate that.

Mr. MONTAGUE. Congressman, this has been a small part in our overall operation, with the half time of one man for the year. In 1963, nine of our divisions had no tests given by an inspector. And five divisions had no tests whatsoever. So you see, for some of the men there was no reason to have refresher courses because machines were not being used.

Mr. HARDY. That is a good point. I do not know whether they got any good out of the refresher courses anyway. Apparently not many of them went. They were evidently concerned with other aspects of investigation which may be just as effective.

Anyway, Mr. Chairman, I think we have demonstrated here that if the Department is going to proceed in the use of these machines, I would hope that they would develop some rather definite policy which will be clearly spelled out and not just by the haphazard methods we have been running around Robin Hood's barn on today.

These things may have some useful purpose and I do not mean to discount that. But I think that we ought to know a little bit more about how we are using them and about the competence of the people that are using them.

As far as these seminars are concerned, have you had any in which you could evaluate the graphs that have been made? You did not have the machines that were making the graphs.

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Mr. BALEIKO. If you had your graphs there and the questions that were formulated, you always had people you could consult with at the seminars.

Mr. HARDY. But you did not have any graphs because you had nothing but the B. & W. machines, unless somebody else had made them for you.

Mr. BALEIKO. No, I was able to run polygraph tests.

Mr. HARDY. How many did you actually have? How many did you actually run on the polygraph machines during this period of time, Mr. Baleiko?

Mr. BALEIKO. I would estimate between 1948 and 1950, before the B. & W.'s were furnished, I had conducted about 175–180 polygraphic tests.

Mr. HARDY. That was between 1948 and 1950. That was a long time ago.

Mr. BALEIKO. Yes, sir.

Mr. HARDY. After you got rid of the B. & W.'s, how many actual graphs did you make?

Mr. BALEIKO. I would estimate maybe five a year. I did not run that many polygraph tests then.

Mr. HARDY. Was there anything to indicate how many of these tests that you referred to earlier were made with polygraphs and how many were made with the B. & W. gadget?

Mr. BALEIKO. I was the only examiner that had polygraph training. I was the only one that could be concerned with the polygraph.

Mr. HARDY. But you did not even have a polygraph to use unless you borrowed one.

Mr. BALEIKO. That is true. One was available to me, and that was the only way I could use it. It was not our machine.

Mr. MONTAGUE. Congressman, in answer to the question you just asked, the statistics we gave the committee were for fiscal year 1963, and as was developed during the questions here, Mr. Baleiko did have his Deceptograph machine all during that fiscal year. He made 233 of the tests which were made by inspectors that year. That represented 70 percent of the tests made by inspectors. So 70 percent of the tests made in this year were on the three-phase polygraph machine.

Mr. HARDY. Thank you, sir.

Mr. MONTAGUE. If I may, I would again like to make the point that perhaps one of the reasons why some of our policy does not seem to be so clear is that in the beginning I mentioned that we had the investigation by Inspector Baleiko made in 1961 to determine whether we should maintain or retain the capability of operating the polygraph machine. And if is was decided that we should, then to give our inspectors formal training and get good equipment, to go at it in the proper way, or else get out of the program completely.

We decided that it would be beneficial for us to continue to have this capability. That is why we went into this program. It is new: it has not had a chance to develop yet. But I think it is in line with what this committee has been suggesting, that we do not use a one-phase machine, that we do have qualified operators, that they be properly trained.

This is our goal.

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Mr. HARDY. That is good. I have no objection to your developing policy as you go. Maybe that is the only way you can do it. You have not been very long with this particular type of polygraph machine. I think the committee, though, is going to be interested in finding out what you do in connection with the establishment of policy and seeing that that policy is carried out. Your policy is no good unless it is carried out. The so-called on-the-job training is no good unless you have a qualified operator doing the training.

Thank you.

Mr. Moss. Mr. Kass?

Mr. KASS. You stated earlier that a postal inspector always knows when a polygraph examination is being given; is that correct?

Mr. MONTAGUE. Always knows? In what relation are we talking about it?

Mr. KASS. I was quoting your language.

Mr. MONTAGUE. In what context did I state that?

Mr. KASS. Let me ask the question another way. Who makes the decision in the postal inspection service to give a polygraph examination?

Mr. MONTAGUE. The inspector handling the investigation makes the decision as to whether or not he feels it is necessary. If it involves a postal employee, then in all such cases he has to talk to his inspector in charge and tell him what the case is about, and why he thinks the test is necessary, and get the approval of the inspector in charge or the deputy or assistant in the division, one of those three.

However, under this program where we have six operators, the inspector in charge will have to be informed in practically every case because arrangements will have to be made for one of these six men to travel to the place where the test is to be given.

Mr. KASS. Do you make a distinction between a postal employee and a person outside of the Department, as far as who is to be notified?

Mr. MONTAGUE. We have up to now; yes, sir.

Mr. KASS. Is that contained in Miscellaneous Bulletin No. 306, dated December 12, 1963?

Mr. MONTAGUE. Yes, sir.

Mr. KASS. Mr. Moss, I would like to insert the bulletin into the record.

Mr. Moss. Is there objection?

If not, it will be inserted in the record. (See exhibit 29, p. 504.)

Mr. KASS. Is this your only regulation or bulletin?

Mr. MONTAGUE. That is the only existing bulletin.

Mr. KASS. That is the only bulletin pertaining to polygraphs. In paragraph 4 it states that—

> Polygraph examinations may be called for in criminal cases of more than average importance where investigation is at a standstill because an inspector cannot prove a suspect guilty or eliminate him from suspicion. * * *

Then it continues.

Does the polygraph then come in to prove the suspect guilty?

Mr. MONTAGUE. It does not prove the suspect guilty, but it could serve to eliminate some innocent people. We quite often have a situation where, to get back to our registered letter, again, five or six people may have had access to it. When the investigator talks to them, they all have reasonable stories as to what they did and what

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they were doing, and where they were. Each one is involved in the handling of the letter which is under investigation. Each one on the surface is a likely suspect. You talk to each one and you develop no evidence by the normal interrogation means.

You ask, "Are you willing to take a lie detector test?" and most times the operators have found, that not only are those involved willing but they want to take a lie detector test, because those who are not guilty of anything want to be freed of any suspicion. They want to be absolved of blame.

We have had cases where people asked to be permitted to take a lie detector test without any suggestion from the operator.

Mr. KASS. Mr. Montague, where the polygraph exam is given to a postal employee, what happens to that information? Is that put in his personnel file?

Mr. MONTAGUE. It is in the investigative file. It is not in the employee's personnel file.

Mr. KASS. Is any information put in the employee's file of a refusal to take the exam?

Mr. MONTAGUE. No.

Mr. KASS. Mr. Baleiko, you stated you would be running the seminars in the future.

Mr. BALEIKO. No, I said I would propose, maybe, a program of such type, and I would like to take part in it as much as I can. The decision would be up to the Chief.

Mr. KASS. What is your training in polygraph?

Mr. BALEIKO. I have had considerable experience in all lie detection work since 1948. I have maintained an interest in reading all material I can on it, the actual operation of the instruments; I have had the experience now of having operated more than one type of instrument; I can talk about each one; I know the field, I think, and I have been in it. I can prepare notes. I can instruct.

Mr. KASS. Mr. Baleiko, can you review other operators' determinations?

Mr. BALEIKO. Providing the operation is standardized.

Mr. KASS. By standardized, do you mean by the zone comparison theory?

Mr. BALEIKO. If that method is used; yes.

Mr. KASS. Is that method taught in the Gormac School?

Mr. BALEIKO. I am not positive.

Mr. KASS. Could you supply that for the record?

Mr. BALEIKO. That could be obtained; yes.

(The information to be furnished follows:)

The Gormac School course for polygraph operation does include instruction in the zone comparison theory (Backster technique).

Mr. KASS. Are you familiar with the zone comparison theory?

Mr. BALEIKO. Yes.

Mr. KASS. Have you taken courses in it?

Mr. BALEIKO. No; no formal courses. I have acquired information and knowledge about it from the seminars.

Mr. KASS. From the seminars in Oklahoma and from Mr. Backster's slides?

Mr. BALEIKO. Yes; that is right.

Mr. KASS. What is your training so far as psychology courses?

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Mr. BALEIKO. Formally, what I had in 1 year of college psychology.
Mr. KASS. What is your training in physiology courses?
Mr. BALEIKO. The same thing.
Mr. KASS. One year?
Mr. BALEIKO. Yes.
Mr. KASS. As regards to the polygraph or just in general terms?
Mr. BALEIKO. In general, and also what was taught in the Keeler school in connection with the course there. We had lectures on psychology and physiology, as they are applicable to the lie detection operation.
Mr. KASS. How long a course was at the Keeler school?
Mr. BALEIKO. A 6-week course.
Mr. KASS. What is your legal training?
Mr. BALEIKO. My knowledge of the legal aspects of the polygraph operation or otherwise was gained mostly from experience and the reading of papers on the subject.
Mr. KASS. Again, the same papers that were presented by the various experts?
Mr. BALEIKO. That is correct.
Mr. MOSS. There is a quorum call in the House. It is necessary that the Members leave.
Gentlemen, I think we can dismiss you, that it will not be necessary to recall you. However, there will be some additional information that the committee will require. That will be contained in a request directed to you, Mr. Montague.
Mr. MONTAGUE. Yes, sir.
Mr. MOSS. The record will be held open to receive it.
I thank you for your appearance.
The subcommittee is now adjourned.
(Whereupon, at 12:15 p.m., the subcommittee adjourned subject to call of the Chair.)

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APPENDIXES

(Exhibits 1 through 26 appear in parts 1–3 of these hearings)

EXHIBIT 27A—BIOGRAPHICAL SKETCH OF HENRY B. MONTAGUE, CHIEF U.S. POSTAL INSPECTOR, POST OFFICE DEPARTMENT

Henry B. Montague, Chief U.S. Postal Inspector, was appointed to that position February 14, 1961. Mr. Montague was born November 28, 1911, at Beacon, N.Y., and attended primary schools in that city. He later attended New York University.

Mr. Montague entered the postal service as a substitute clerk at Poughkeepsie, N.Y., February 17, 1937. He worked his way up through clerical and supervisory ranks and was promoted to the position of postal inspector in 1942. From 1942 until 1951 he handled a wide variety of major postal inspection cases while assigned to the New York division. His investigations took him to many parts of the country.

In May 1951 Mr. Montague was made inspector in charge of the New York division, Postal Inspection Service. In that capacity he headed the postal inspectors covering the State of New York. He had wide responsibilities in the protection of the U.S. mails, in inspections of more than 1,700 post offices, in the prevention of crimes against the postal service and the apprehension of violators, and in many other administrative and law enforcement areas involving the postal service in New York State. He held the position of inspector in charge at New York until the time of his appointment as Chief Postal Inspector.

The Chief Inspector is married and has two daughters. The Montagues maintain their residence in Arlington, Va.

EXHIBIT 27B—BIOGRAPHICAL SKETCH OF FRANCIS W. BALEIKO, POSTAL INSPECTOR, POSTAL INSPECTION SERVICE, POST OFFICE DEPARTMENT

Francis W. Baleiko was born July 18, 1914, at Harvey, N. Dak. He received his high school education at Chicago, Ill., and attended Crane Junior College.

In November 1936, he entered on duty as a substitute clerk in the Chicago, Ill., post office subsequently advancing to the position of clerk in charge from which position he was appointed as postal inspector on January 8, 1949. For approximately 2 years prior to his appointment as an inspector, he assisted postal inspectors of the Chicago division in the conduct of inquiries relating to reported losses of mail.

Following completion of his training period as an inspector, Mr. Baleiko was assigned primarily to the conduct of criminal investigations, predominant among which were those relating to theft of mail. For more than 10 years he has been assigned on a full-time basis to the conduct of complex investigations relating to armed robberies, burglaries, and theft of mail in the Chicago division of the Inspection Service.

In 1948, Mr. Baleiko completed a course of instruction and qualified as an operator of the Keeler polygraph. He has continuously had responsibility for lie detector operation since 1950. He has maintained active membership in the Academy for Scientific Interrogation and has kept abreast of developments in the fields of lie detection and criminal interrogation through attendance at seminars held at Austin, Tex., in August 1958, at the University of Oklahoma, Norman, Okla., in March 1963, and at New Orleans, La., in August 1963.

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EXHIBIT 27C—BIOGRAPHICAL SKETCH OF MARLIN W. BROWN, DIRECTOR, MAIL LOSS AND DEPREDATIONS DIVISION, BUREAU OF THE CHIEF POSTAL INSPECTOR, POST OFFICE DEPARTMENT

Marlin W. Brown was born May 8, 1912, at Baltimore, Md. He received his education at the Garey Army and Navy Preparatory School, Baltimore, and Charlotte Hall Academy, in Maryland.

In May 1931 he entered on duty with the postal service serving as a clerk-carrier, railway postal clerk, and sea post clerk until his appointment as a postal inspector on April 16, 1939.

Mr. Brown entered the military service on July 20, 1942, and was assigned to the Army postal service. He was honorably discharged on June 28, 1946, with the rank of lieutenant colonel. He continued to serve in the Army Reserve and currently holds the rank of colonel.

Mr. Brown has been primarily associated with depredation and related criminal investigations throughout his career as a postal inspector.

In August 1958, Mr. Brown was designated national coordinator of major service depredation investigations. On October 4, 1959, he was promoted to his current position of Director of the Mail Loss and Depredations Division at the headquarters of the Inspection Service in which capacity he is responsible for directing the investigative programs of the service relating to mail theft, armed robberies, burglaries, and certain other major postal crimes.

EXHIBIT 28—LETTER FROM H. B. MONTAGUE, CHIEF INSPECTOR, POST OFFICE DEPARTMENT, TO BENNY KASS, MARCH 24, 1964

POST OFFICE DEPARTMENT,
CHIEF POSTAL INSPECTOR,
Washington, D.C., March 24, 1964.

BENNY KASS,
House Government Information Subcommittee,
Rayburn Office Building,
Washington, D.C.

DEAR MR. KASS: This has reference to your inquiry concerning the use of lie detectors by this service.

In the attachment to our letter of July 26, 1963, to Hon. John E. Moss, it was stated (question 4) that we had 17 machines, but that 13 of them were acquired more than 10 years ago, and employed only a one-phase detection procedure. Of the remaining four, two were three-phase Stoelting polygraphs, and two were modern one-phase B. & W. machines, acquired more recently. This was the status of our lie detection equipment at the close of fiscal year 1963.

In fiscal year 1964 we purchased four Keeler polygraphs, all of them three-phase detection instruments, and have disposed of all one-phase machines. Accordingly, we now have in current use six 3-phase polygraphs on a service-wide basis which cost $7,080. The six postal inspectors who operate them received formal training at recognized schools.

Sincerely yours,

H. B. MONTAGUE, *Chief Inspector.*

EXHIBIT 29—POST OFFICE DEPARTMENT MISCELLANEOUS BULLETIN

[Bulletin No. 306, Dec. 12, 1963]

POLYGRAPH PROGRAM

1. A total of six inspectors have completed formal training as polygraph operators. It is anticipated that all of them will be supplied with machines and in a position to give examinations beginning January 15, 1964, or shortly thereafter.

2. The divisions with polygraph examiners, and divisions to be served are as follows:

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Examiner assigned to:	*Divisions to be served*
Atlanta	Atlanta and Chattanooga.
Chicago	Chicago, Fort Worth, Kansas City, and St. Paul.
Cincinnati	Cincinnati and St. Louis.
New York	New York and Boston.
Philadelphia	Philadelphia and Washington.
San Francisco	San Francisco, Denver, and Seattle.

3. The foregoing are not intended to be arbitrary boundaries. If the polygraph operator serving a particular division is not available, the inspector may request assistance of the operator in the nearest division. Inspectors in the Chicago and New York Divisions are available now to give examinations. The Inspectors in Charge of the other four divisions will advise other divisions concerned in the event any problem is experienced which would prevent giving examinations commencing about January 15.

4. Polygraph examinations may be called for in criminal cases of more than average importance where investigation is at a standstill because the inspector cannot prove a suspect guilty or eliminate him from suspicion even though he has exhausted all normal investigative techniques. The foregoing will also apply to cases involving postal employees; however, requests for such examinations will be cleared through the Inspector in Charge, or in his absence, his deputy or assistant.

5. It is emphasized that the polygraph must not be used as a substitute for other normal investigative and factfinding procedures.

6. It is our desire to be self-sufficient as a service in providing technical support in criminal investigations, and the services of our operators should be used, especially in giving examinations to postal employees. We realize, however, that this may not be practicable in some instances, in view of urgency, distances involved, and cost of travel by our operators. In such instances polygraph examinations may be obtained locally where satisfactory arrangements are in effect.

7. B. & W. lie detectors, which were acquired about 10 years ago, may now be disposed of under accountable property procedures as specified in section 23, CIDH.

H. B. MONTAGUE, *Chief Inspector.*

EXHIBIT 30—LETTER FROM H. B. MONTAGUE, CHIEF INSPECTOR, POST OFFICE DEPARTMENT, TO HON. JOHN E. MOSS, JUNE 30, 1964, WITH ANSWERS TO QUESTIONS RE USE OF THE POLYGRAPH

POST OFFICE DEPARTMENT,
CHIEF POSTAL INSPECTOR,
Washington, D.C., June 30, 1964.

Hon. JOHN E. MOSS,
House of Representatives,
Washington, D.C.

DEAR CONGRESSMAN: In accordance with your letter of June 15, there is attached a statement containing answers to the questions asked regarding use of the polygraph.

Sincerely yours,

H. B. MONTAGUE, *Chief Inspector.*

1. What are the qualifications as polygraph operators of Prof. R. L. Holcomb, Department of Public Affairs, Iowa State University, Iowa City, Iowa, and Mr. F. W. Quinn, of Quinn & Associates, Greensboro, N.C.? (We are also referring to qualification of Mr. Clinton B. Hanscom and John E. Reid & Associates; see mention of them in our letter of June 19, 1964, in answer to question No. 6 in your leter of June 1, 1964.)

Prof. R. L. Holcomb, Department of Public Affairs, University of Iowa, Iowa City, Iowa:

Mr. Holcomb is 52 years of age and an assistant professor and Director of the Bureau of Police Science, at the University of Iowa. He is a member of the International Association of Chiefs of Police; the Iowa Association of Chiefs of Police and Peace Officers; the American Academy of Polygraph Examiners, and a past president and a member of the board of directors of the last named organization. He received a bachelor of general science degree from Iowa

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State University, Ames, Iowa, in 1933, a masters degree in psychology from the State University of Iowa in 1936, and is a graduate of the School of Traffic Police Administration, Northwestern University, class of 1937. He was employed as a research assistant while studying for his masters degree at the University of Iowa. At Northwestern University he was acquainted with, and worked informally with Mr. Leonarde Keeler, head of the Crime Detection Relations School. Mr. Holcomb stated he actually began polygraph examinations in 1948, and estimated having given 3,000 examinations. He uses a Stoelting Polygraph. Through the University of Iowa, his services have been gratis to any government enforcement agency.

Mr. Freddie W. Quinn:

This service first learned of Mr. Quinn in 1957 when he was employed as chief investigator at Camp Lejeune, N.C. in a civilian capacity. He held that position for approximately 4 years and then went into business for himself in Greensboro, N.C. as Quinn & Associates. While at Camp Lejeune, Mr. Quinn operated the polygraph for the military service and enjoyed a good reputation. At Greensboro Mr. Quinn, besides handling private business, was employed for a time to give polygraph tests for the local police department.

Mr. Clinton B. Hanscom, director, Department of Police, University of Minnesota:

Mr. Hanscom is 61 years of age, and has been engaged in police work for about 40 years. He has been associated with the University of Minnesota for the past 30 years. His educational background is in the fields of business administration in which he holds an A.B. degree, and criminology. Also, he has several extension credits. He is a past president of the board of the Academy for Scientific Interrogations; a member of the American Academy of Polygraph Examiners, the American Academy of Forensic Sciences and other police and criminologist organizations. He originally studied the polygraph at Northwestern University for 11 months under Mr. Keeler. He has conducted extensive research in the field of interrogation and is considered to be extremely well qualified by members of law enforcement agencies in the Middle West. He is the author of a paper entitled "Modern Interrogation Techniques" which has been printed in seven languages and distributed to numerous police agencies throughout the world.

John E. Reid & Associates, Chicago, Ill.:

It is understood that Mr. John E. Reid has appeared before your committee and that you have a record of his qualifications as a polygraph operator.

2. What is the specific statutory authority for the Post Office Department to dispose of Government equipment without going through the General Services Administration?

GSA Regulation 1–IV–402.01 is the statutory authority involved. This regulation authorizes the abandonment, destruction, or donation to public bodies by an executive agency, after it has been affirmatively found, by a duly authorized official of such agency either that (1) such property has no commercial value, or (2) the estimated cost of its continued care and handling would exceed the estimated proceeds from its sale.

3. Has the postal inspection service established minimum qualification requirements for commercial polygraph operators who do contract work with the service? Have these been incorporated into any bulletins or regulations? Provide two copies of any such instructions.

Those listed in answer to question 1 above are the only ones not members of Government agencies who have given polygraph tests at request of our agency over the past 10 years. However, a list of qualified polygraph operators in private practice is being compiled and completion is expected in the early part of September 1964. Use of such polygraph operators has been very limited in the past, and it is expected it will be on an even more restricted basis in the future. It is intended to disseminate a list of such qualified operators to inspectors.

4. During the course of the hearing, you stated: "Well, we do know that we have had benefits from it (the polygraph). We may not have evaluated it in the way you outlined, but we do know that we have had benefits from it." Please furnish a summary of the benefits which the Postal Inspection Service has derived from the polygraph.

In making my statement I had in mind cases of which the following are examples:

In a case involving a shortage of $500 in a registered letter containing an official remittance from a postal station, investigation developed a suspect who denied the theft. The superintendent of the station presented a request to

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the postal inspector that he and seven other employees including the suspect be given examinations. The examinations which were, of course, all taken voluntarily showed reactions of guilt on the part of the one considered as the logical suspect. He subsequently admitted the theft.

A relabeled parcel was noted in handling at a post office. Investigation established that the addressee was a postal employee in the parcel post section. The parcel was delivered to the address shown on the parcel. The employee accepted it there, and was promptly questioned about it. He denied knowledge of the parcel and volunteered to take a polygraph examination. During the preliminary talk while preparing to take the polygraph examination, he admitted he had addressed the parcel to himself.

A railroad baggageman was developed as a suspect in connection with the disappearance of a registered article containing $8,000 in currency, and volunteered to take a polygraph examination which indicated guilty knowledge. However, he stoutly maintained his innocence. Most of the missing money was subsequently discovered packed in tin containers which were hidden behind loose rocks and dirt in his basement.

EXHIBIT 31—LETTER FROM CAPT. C. R. KEAR, JR., U.S. NAVY, TO BENNY KASS, JUNE 17, 1964

DEPARTMENT OF THE NAVY,
OFFICE OF THE SECRETARY,
Washington, D.C.

MR. BENNY L. KASS,
Counsel, Committee on Government Operations, Subcommittee on Foreign Operations and Government Information, House of Representatives, Washington, D.C.

DEAR MR. KASS: This is in reply to your verbal request pertaining to a galvanometer (B–W machine) which was obtained by the District Intelligence Office, 13th Naval District, from the General Service Administration. Information from the Office of Naval Intelligence indicates that the District Intelligence Office, 13th Naval District was informed that the B–W machine was on the GSA availability list and one was obtained at no cost, and examined. At no time was consideration given to use this machine in any way in Naval Intelligence investigations. The machine was inoperable and was never used by any personnel in the District Intelligence Office. The B–W machine has been destroyed beyond use.

I hope this information answers your questions concerning this matter. Please inform me if I can be of further service.

Sincerely yours,

C. R. KEAR, JR.,
Captain, U.S. Navy, Deputy Chief.

EXHIBIT 32—STAFF MEMORANDUM FROM MARVIN G. WEINBAUM, INVESTIGATOR, FOREIGN OPERATIONS AND GOVERNMENT INFORMATION SUBCOMMITTEE, TO HON. JOHN E. MOSS

A total of 305 polygraph examinations given at the request of the Federal Government in fiscal year 1963 were not, in fact, conducted by the requesting agency. A subcommittee inquiry of June 1, 1964, disclosed that 11 Federal agencies used the services of examiners from State and local governments, private firms, or other units of the Federal Government.

The overwhelming number of the "outside" examinations were performed by state and municipal police departments and other local law enforcement agencies. By using the services of state and local governments, the Federal Government incurred costs of only $5.40 during fiscal year 1963 for a total of 228 polygraph examinations. The Post Office Department and the Secret Service, with requests for 115 and 79 tests, respectively, relied most on State and local governments.

Only the Secret Service reported using the services of a commercial firm for polygraph examinations in fiscal year 1963. John Reid & Associates of Chicago was paid $50 for each of 18 tests, the costs being covered by the Federal Reserve Bank of San Francisco.

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Ten of the eleven Federal agencies reported using the services of another agency within the Federal Government for 59 tests. Intelligence units of the Army, Navy, and Air Force were most frequently called upon.

Despite the low costs to Federal agencies for the services of "outside" examiners, it is questionable what has been purchased. No careful attempt was made to determine local examiners' training, or to see that their equipment and procedures conformed to high professional standards. The prime failure, however, rests with the Federal Government for having neglected to provide the necessary guidelines and standards.

EXHIBIT 33—STATEMENT SUBMITTED BY THE AMERICAN FEDERATION OF GOVERNMENT EMPLOYEES ON THE USE OF THE POLYGRAPH BY FEDERAL AGENCIES

The extent and circumstances of the use of the polygraph in various aspects of Federal employment is sufficiently disturbing that the American Federation of Government Employees recommends that such use be completely discontinued.

This recommendation is made in the belief that use of the polygraph in hiring is not necessary and that whatever advantage might accrue to the Government is greatly outweighed by the instances of harm to the prospective employee which have occurred and may occur again if polygraph tests are continued.

When 19 out of 58 Federal agencies queried stated that they regularly used polygraph machines, there was significant evidence that the problem thus created is sufficiently widespread to call for remedial action. Furthermore, the fact that these 19 agencies own 512 machines and this equipment was used in 19,122 tests shows the extent of the application of polygraph technique to various situations arising in Government operations. The agencies reporting did not include the Central Intelligence Agency or the National Security Agency, both of which require polygraph machines to be used for employment screening.

The 19 agencies reporting the manner in which this equipment is used indicated that the tests are given only with the voluntary consent of the person to be tested. Even in the screening programs of CIA and NSA applicants may refuse to submit to polygraph testing, although such a refusal in CIA is considered along with other information developed and in NSA leads to more exhaustive investigation.

It seems clear that an employee may be penalized by submitting to a test that is improperly given or incorrectly interpreted. In the case of refusal he chances the implication that it is evidence that he has something to hide and therefore would not be a desirable employee.

Of paramount consideration in determining the course to be taken in dealing with polygraph technique is that a Federal agency should make the utmost effort to respect the rights of the individual who is being questioned while under consideration for prospective employment. It is a severe indictment of those using the polygraph unnecessarily as part of the recruiting procedure that individuals have been subjected to humiliating experiences. It is apparent from testimony already given to the House Government Operations Committee that polygraph tests are not appropriate to employment screening and that their use is completely indefensible in recruiting for the more routine type of position when security is not a factor.

Discussion of polygraph use by those who are deemed to be expert has raised some basic questions as to reliability of the machine as a means of testing the truthfulness of an individual. Analysis of committee testimony seems to indicate that polygraph testing as a truly scientific procedure is questionable. It appears to be better adapted to inducing a confession in the course of a criminal investigation. Seldom can its advocates clearly and reliably determine that a subject is truthful or deceptive unless the polygraph procedure has been followed by a confession by someone involved in a case. Thus its use has been termed a mental blackjack by those who declare its results are not reliable and measurements attempted are not valid.

It is understood that use of the polygraph as a diagnostic procedure has been relied upon for determining truth or deception by means of a course of several examinations. A great deal admittedly depends upon the examiner's interpretation of the responses obtained. And this fact points up the principal element in attempting to evaluate the polygraph, which is the adequacy of the individual conducting the test.

Discussions by recognized experts indicate that the person conducting the polygraph test must be someone with a good education background, having what is comparable to a college education. Mr. Fred E. Inbau, the law professor

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trained in polygraph technique who made this observation, also stated that a suitable examiner implicitly must be a person of intelligence and maturity. In short, he must seek to protect the public interest and safeguard national security, and be particularly respectful of the rights of the individual.

It was stated by the same expert that possibly 80 percent of the users of the polygraph do not meet the standards for skillful and reliable technicians in this field. The proposal has been made that an interdepartmental committee should investigate the qualifications of examiners now practicing in the Federal service, and should suggest standards not only for the training of examiners but also should consider the type of questions to be asked and fix appropriate norms for conducting these tests. We concur heartily in the need for such an investigation.

Certainly standards of training and use must be substantially raised before any great measure of reliance can be placed on polygraph testing. Even then its utilization should be permitted under circumstances which permit maximum protection for the individual to be tested by such means.

As already stated, it seems highly desirable that the Federal Government abandon its use of the polygraph for the purpose of screening applicants for positions in the Federal service. In this respect, the Federal Government can well follow the example of Massachusetts and prohibit the use of the polygraph examination as a condition of employment.

To sum up our position: the American Federation of Government Employees urges the elimination of lie detection tests from preemployment investigation. We make such a recommendation because such tests are not a necessary part of that procedure. This is particularly true of hiring procedure for the more nearly routine type of work. Other techniques, if carefully and intelligently applied, are adequate for that purpose. If the polygraph is to be used at all in the Government service, its use should be confined to situations related to the detection of crime or involving the conduct of individuals as it pertains to what are truly matters of national security.

We are appreciative, Mr. Chairman, that we are enabled to submit these comments for the consideration of the committee.

EXHIBIT 34—STATEMENT OF GOVERNMENT EMPLOYES' COUNCIL, AFL–CIO

Mr. Chairman and members of the subcommittee, during the past several months, this subcommittee has been engaged in a significant inquiry into the utilization of polygraphs by Federal agencies. We desire to extend our commendation to you and your colleagues for your keen interest in this highly important and sensitive phase of personnel policy.

The Government Employes' Council has associated with it 29 unions, whose members are employed by the Federal Government. Some of these organizations consist solely of Federal workers; others have members in private industry and government. Together they represent an important cross-section of opinion among Federal postal, classified, and wage board employees.

The subcommittee's preliminary study of the subject revealed a widespread use of the device by various Federal agencies. On the basis of the number of polygraphs in use, the funds expended for administration of the tests, and the number of individuals to whom the tests were given, the subcommittee's inquiry assumes great importance.

Of equal concern, however, are the validity of the test results and the safeguards available to individuals who either consent or are required to undergo a polygraph examination.

Since some agencies employ the device in determining cases of alleged misconduct or criminal activities of employees, it is essential that a judgment be reached on the accuracy of the process and the protection of individual rights.

When we recall that an individual's ability to secure or retain a job in the Federal Government and his future character references may hinge in large measure on the findings of the polygraph examination, the necessity for certainty about the accuracy of the results becomes apparent.

It has been stated that not the lie detector machine, but the operator, is primarily responsible for the results of these examinations. The examiner must interpret the responses which the polygraph records. Thus, much depends upon the training and personal psychological stability of the operator.

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Responses of the Federal agencies to the subcommittee's questionnaire reveals a wide variation in the qualifications required by examiners. Education, experience, training, and miscellaneous requirements covered a wide range.

Moreover, the subjective nature of the judgments made by the operator make it difficult to refer to norms, which will assure the individual undergoing the test that there will be an objective evaluation of his responses. Dr. H. B. Dearman and Dr. B. M. Smith in the May 1963 edition of the American Journal of Psychiatry described in detail a series of polygraph examinations administered by different persons to the same subject. Interpretations of the individual's responses differed widely.

An article in the Tennessee Law Review (22: 729, 1953) offers ranges of error in the use of polygraphs.

"Studies which have been made indicate that with highly trained and experienced examiners, we can expect incorrect judgment in 3 percent of the cases and inability to make a confident judgment in about 17 percent. Where trained examiners have less experience, we can expect incorrect analysis in at least 10 percent of the cases and ambiguous records in more than 20 percent."

The least that can be said is that the validity of polygraph findings is dubious. There is no clear-cut, compelling evidence to refute the opinion that the testee's physical and psychological reactions to the entire test procedure will influence the results contrary to the facts.

Other basic questions are involved, also. Should the individual to be tested have the benefit of a physical examination before undergoing a polygraph examination, and should the services of a qualified physician be available in the interpretative phase of the proceedings? Should the person be entitled to counsel, if he feels it necessary, before and during the examination? What are the legal implications of the polygraph to the rights of the individual citizen? What opportunity should be available to the individual who desires to contest the findings of the test? Should the results be made available to the person examined?

Where questions of security or alleged criminal violations are involved, the problem is much more difficult. Defense or security considerations indicate the welfare of the country as the principal consideration. At the same time, the Federal Government must be ever conscious of the desirability of preserving the basic rights of individual citizens.

To what extent are the results of polygraph tests the determining factor in a person's obtaining or retaining Federal employment? If they are only one tool among many to ascertain an individual's veracity and his suitability for Government employment, they can be dispensed with as unessential. If they are the factor upon which hangs a decision, conflicting opinions on their value makes their usefulness questionable.

The conclusion emerges that the conflicting views of the machine's accuracy, the wide variation in qualifications of operators, the serious implications of law and equity involved in its use warrant a moratorium on its application in preemployment screening and noncriminal disciplinary procedures in the Federal Government. Until such time as a more meaningful evaluation of the scientific accuracy of the device can be made and the qualifications of operators can be standardized, there is no need to subject individuals to the psychological and other hazards now inherent in use of the equipment.

We urge that the subcommittee continue its review of the polygraph in Federal activities, with particular attention to the validity of lie detector test results.

Our organization appreciates the opportunity to offer these comments on a serious and vital question.

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